

FRENCH . 1652







73,541/A

Handwritten signature or name in cursive script, possibly reading "E. J. Taylor".

Many things is done
to the appearance of me
at my name of post
E. B. H. H.

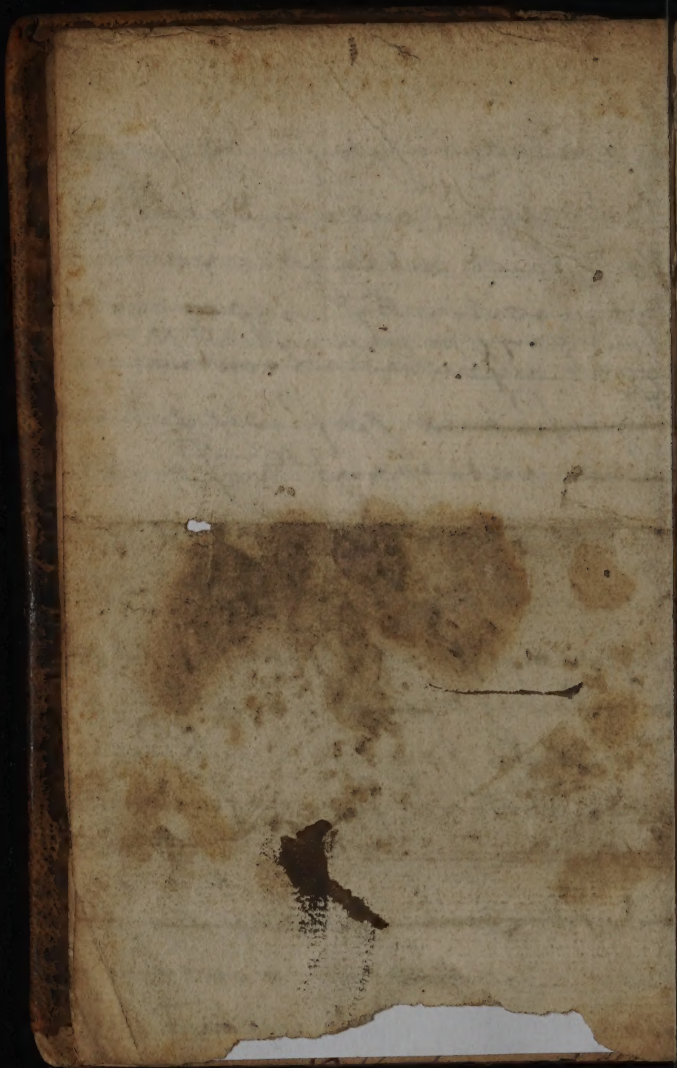
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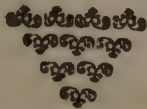
Prin

734
The York-shire Spaw,
OR A
TREATISE

Of four Famous Medicinal Wells,
viz. the Spaw, or Vitrioline-Well; the
stinking, or Sulphur-Well; the Drop-
ping, or Petrifying-Well; and
St. *Magnus*-Well, near *Knaref-*
borow in *York-shire*.

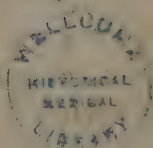
TOGETHER
With the causes, vertues, and
use thereof.

Composed by John French, D^r. of Physick.



L O N D O N,
Printed for E. Dod, and N. Ekins, and
are to be sold at the Gun, in
Ivy-Lane. 1652.

73404





Celeberrimo viro, THEO-
DORO de MAYERNE, Equiti
Aurato, triumque Monar-
charum Archiatro

ὕψιστον.

Cui nisi Medicorum Monarcha,
Monarcharumque medico dicere
liceat opellam hanc de eo elemento
elucubratam, quod Germanum Fovis,
ac Nepotem Saturni ingeniosa finxit
antiquitas, cunabula rerum depictu-
ra? Hanc dextrâ omnibus porrectam
si tua passim celebrata claritas serenio-
re fronte decorari dignetur, nubilo-

*sa Momorum supercilia non est quod
vereor. Tenera quidem proles est, sed
si coruscantes Phæbei tui laminis radios
irretortè contueri polleat, non dubitan-
dum est, quin genuina agnoscetur, nec ut
adulterina a Medicina Mystis abdi-
cabitur, nec a me illius susceptore abne-
gabitur, repudiabiturve. Et quid tibi
Philosophorum Cynosura justius deferri
poterit, cum Universi penè Philosopho-
rum, sive flores, sive faeces, hoc argu-
mentum meum extitisse primam mate-
riam, ex qua exoriuntur Universa,
nec contradicente plebeculâ, & imbi-
berunt, & tradiderunt? Quid enim
creatum complectitur natura rerum non
ex aqua humectante, & coalescente
adul-*

adultum , & animatum ? Ignem quid
humoris expers pabulatur ? Aërem ve-
rò nuncupari attenuatam aquam quili-
bet cerdo se explorâsse gloriatur. Ter-
ram quoque exuccam in pulverem re-
digi , & fatiscere omnis tressis agaso
deblatterat. Quid spirat , vernat ,
crescit , consistit sine suo fluore ? Ani-
malia , plantas , lapides , metalla testor.
Sed hac prolixius tuæ eruditioni multi-
faria philosophari , perinde est ac no-
ctuas ad Athenas deferre , & Cramben
bis coctam apponere , vel capulam unda
in Oceanum(θάλασσα velut viror ab ef-
fectu dictum) instillare satagere , qui-
bus minutiis supersedere consultius au-
tumo.

Digneris itaque in hisce nostris scaturiginibus, dulcibus, salsis, & mediocribus, in Oceanum, veluti tuæ censura influentibus, Candoris tui tridentem intingere, ut, te jubente, effluant puriores, hydropotisque gratisimæ. Hoc mihi votum si dederis concessum, ad majora ibo alacrior, quæ tuæ tutela (si cui) commendare gestiam, & interim ipse audire

Tua Amplitudini

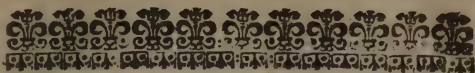
Londini Maii 21^o.

devotissimus

1652^o.

JOH. FRENCH.

To



To the READER.

Reader,

I Being the last year commanded by my occasions down to the Spaw in *Yorkshire*, was desirous to improve my time in applying my self to experiment, & observation: to the one for the discovery of the true causes of those Famous Medicinal waters of *Knaref-borow*: to the other, to be convinced what real effects they wrought upon the drinkers thereof. And this I had leasure, beyond expectation, to do, being prevented from my intended, and speedier return, by reason of the then Northern distractions. Now my experience herein I do freely and faithfully present to the world a publick account of; as for a more full satisfaction of those of mine own profession, (especially some worthy Drs. in the South, who first excited me hereto;) so also for the better direction, and greater success of those that shall make use of those waters.

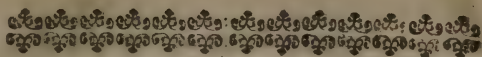
In my observation I perceived that these waters, although very effectual in themselves, yet many times proved the contrarie, and that by reason, first of a want of a
due

due preparation ; secondly of intemperance in dyet; thirdly of a prejudice against the use of all manner of Physick in the taking thereof, which should promote the full operation of them, and prevent the symptoms, which are oftentimes occasioned by them; fourthly by reason of mistaking the proper water; & lastly by not observing a just proportion suitable to the constitutions & maladies. Now for the prevention of whatsoever shall occasion the ineffectual operation of those waters I have published these few lines, which are made up, not of obscure, dark, and such as the vulgar might not understand, but of words plain, and as clear as the glasses themselves wherein the waters are drunk, that every one may see what it is he drinks, clearly seeing therein the true causes, vertues, and use of them.

I do not desire that any should adhere to my judgement herein any further, than they see it consonant to reason; for to that, as also to the candid censure of the learned D^{rs}. of *York-shire*, long experienced in these waters, and to all other, who shall rationally, and civilly convince me wherein I have erred, I subject it. Reader, approve of me according as herein thou findest me

Thy friend

J. F.



CHAP. I.

*The place together with the Nature of
the same, where four famous Medi-
cinall Springs are discovered,
in York-Shire.*



Bout fourteen Miles from
York, Southwest, is situated the
ancient Towne of *Knaresborow*,
formerly famous for the invin-
cible Castle thereof built upon
a Craggy Rocke, but now re-
markable for four famous Medicinall
Springs, which in these latter years have bene
discovered near the same; the names of which
are viz. The dropping or petrifying Well, the
sulphur, or stinking Well, the Spaw, and *St.*
Magnus Well. In naming onely four, I speak
as to the species, or kinds of them, but Doctor
Deane in his treatise of the said Waters men-
tions five, which in effect are but three, for
he speaks as to the Individuals, and names
three sulphur Wells, which indeed differ not
at all, the one from the other, and if at all, yet
onely gradually; and withall he rejects *St.*
Magnus as an ineffectual superstitious relique
of Popery, which notwithstanding, because it
hath of late regained its reputation (as I shall
B after-

afterwards declare) which it had lost in the account of some, I thinke worthy of a place amongst the four famous Wells of *Knaresborough*.

The Nature of that country, especially South-west, is very rocky, yet moorish, & heathy, consisting of an unctuous bituminous earth, which the country People cut at a certaine time of the year, making Turfe, and Peate thereof, which being dryed make good fewell. In that place are found several sorts of Earth, Stones, Minerals, and veins of Metals. Doctor *Dean* observed white, and yellow Marle, Plaister, Oker, Rud, Rubrick, Free-stone, hard greet-Stone, (which broken in the middle doth oftentimes very much resemble Loaf-Sugar,) a soft Reddish-Stone, Yron-Stone, Brimstone, Vitrial, Nitre, Alume, Lead, Copper, and divers mixtures of these; to which I shall add Alabaster, and a glittering sand, which yields some Gold: And certainly many more than these might be discovered, if the experienced Artist would make a diligent search.

CHAP. II.

Of the original of Springs in general.

BEfore I speak any thing of the Nature of Springs, or Fountaines in particular, it will

will be necessary, as conducing to the better understanding of them, to premise something concerning the original of them in general; and the rather, because there have been great controversies betwixt the Stoicks and Peripatetickes about the causes of them. Now the several opinions concerning the original of lasting Springs, (which are called *Fontes perennes*) may be reduced to three heads: for either they proceed from rain-water, or they are generated in the bowels of the earth, or else they must of necessity flow from the Sea through subterranean channels. If any shall object as some have done, and say they may come from subterranean lakes, let me demand of them whether those lakes proceed not from some of the three former, and whether they would not in time be exhausted if otherwise.

*Arguments for the first opinion alleadged-
and answered.*

Arg. They that contend for the first opinion, such as are *Albertus Magnus*, *Georgius Agricola*, &c. Affirme, that in those Countreys where there falls but little rain, the Springs are few and small, and that in winter time all Springs flow more plentifully, than in summer, and that by reason of the wetnes of the Season: and what becomes say they of all the rain, if it sinks not into the earth, and there maintains Springs?

Sol 1. The Assertion concerning the increa-

B 2 sing

ling of Springs in winter is not universally true ; for *St. Magnus Well* in York-shire (as I was most credibly informed by the Woman that hath looked to it, and been the keeper of it for these many years last past) begins to rise high about May, and to fall low about October ; besides divers more Springs which in several counties of this Nation are dried up all the Winter, and flow anew towards the Summer. And *Pliny* makes mention of a certain Spring in *Cydonia* before *Lesban*, that flows onely at the Spring : many more of this nature might be produced if there were occasion.

2. If that were granted to be true which they say, yet it doth not follow that rain is the material cause of Springs, although at that time they break forth, which were before dried up ; for their drying up was not occasioned for want of rain to supply them, but by reason of the dryness of the earth towards its superficies which attracts to it self, and drinks in for the satisfaction of its droughth the water of the Springs, which it doth again let go, when it hath drunk plentifully of the showers from Heaven. Now that the dry earth will drink a great quantity of water, you may see by the drying up of Rivers in a long droughth by the drynes of the earth, although the Fountains, which are the heads of those Rivers, flow plentifully at the same time as some do, although others some be dried up. And as for those Springs which

which break forth onely after great rain, they are caused from the rain which is drunk up by some boggie, spongiouse earth, and is drained from thence, or which is sunk into some caverne, or hollow place, near the superficies of the earth through some secret passage thither, and there being collected in some considerable quantity imitates a Spring as long as it lasts.

3. The gratest part of showers of rain falling upon high places run down from thence into plains, and from plains through small channels or trenches into Rivers, and that rain, which falls upon any place from whence it cannot in some such manner be conveyed away remains upon the superficies of the earth, till it be exhaled by the Sun, as we see in divers places : besides it cannot be imagined that rain sinks so far into the earth as to supply Springs ; and that because it is generally observed by all that dig in the earth, that rain wetts not the earth above ten feet deep : And the reason hereof *Seneca the Philosopher* gives in his third Book *Naturalium questionum* chap. 7. Where he saith, that when the earth is satiated with showers, it then receives in no more, and this we see by dayly experience. Besides, when wee dig a Well, although it be in a soft place, wee dig sometimes one, two or three hundred feet deep, before wee come at quick Springs, and that the rain should sink so deep, it is no way probable ; nay, although there were hallow veins and chinks

in the earth, through which many would have it passe to a great depth; for who cannot easily conceive that those veins and crannies (which yet are not granted to be in every place where there are Springs) are easily stopp'd with dust, or dirt, which the rain carries with it when it is fallen on the earth; or swelled up, and contracted, as we see they are in Summer time with rain after a long drough?

*Arguments for the second opinion Al-
leadged and answered.*

Arg. They that contend for the second opinion, such as *Seneca &c.* affirme that Springs are generated chiefly of earth changed into water, and that because all Elements are mutually transmutable into one the other. And some, as *Aristotle*, and *H. ab Heers*, that Springs are generated of the aire shut up in the earth and by the coldnes thereof condensed into water.

Sol 1. It is more probable according to reason and experience, that by reason of the density of the earth water should more easily be converted into earth, than the earth into water.

2. It is to be wondred at, that seeing that ten parts of air (if not many more) serve for the making of one part of water containable in the same space, there should be so much space in the earth for the containing of so much air as serves for the making of such a quantity of water, as springs dayly out of
the

the earth : Besides so much air being spent, there would of necessity follow a *vacuum*, for where should there be so many, and great crannies, or holes to let the air into the earth fast enough ? But if there were, yet how is it possible that so much air can be corrupted in such a moment, the whole Elementary air being of its owne nature most subtile, and not being sufficient to make such abundance of water as all the Springs of the earth will amount to ? Now although this answer be according to the sence of common *Philosophers*, and sufficient for the satisfaction of this objection, yet *Helmont* will not admit of any such supposition, viz. That air and water can at all be mutually transmuted into one the other. It is true, saith he, that water can easily be turned into a vapour, and the said vapour into water again ; but this vapour is nothing els materially, and formally but a *congeries* of atomes of water sublimed, & air will not in cold or heat yeild water any more then it contains in it the vapour, viz. of rarefied water. For saith he, if those two Elements were so mutually convertible, one species must be transmuted into another, and the air that is made out of water, may be again reduced into the same numerical water-which it was before its rarefaction : but this cannot be, unless you will grant that which all *Philosophers* deny, viz. That *A privatione ad habitum datur regressus* : Lastly for the confirmation of his opinion, he brings in an experiment :

periment : viz. Air shut up in an Iron pipe of an ell long may be compressed by force, that it will be contained within the space of five fingers, which, when it expands it selfe, drives out the pellet (with which it was stopt at the one end) with a sound like to that of a gun, which would not be, if the air thus compressed could have been turned into water by the coldnes of the Iron.

*Arguments confirming the third opinion,
and objections made against it,
answered.*

The third opinion is the most ancient of all, and was held by Plato, and Thales himselve one of the first Philosophers in Greece, and not so only, but is also asserted in sacred writ, viz. *Ecclesiastes* chap. 1. vers. 7. Where the wisest of men affirms, that all the Rivers run into the Sea, and yet the Sea is not full, unto the place from whence the Rivers come, thither they return again.

The reason for the confirmation of this opinion are many, but the chiefeſt are these two : First, because there is not any body besides the vast Ocean, that can afford neer such an abundance of waters as spring from the earth. Secondly, because the Sea it selfe is not increased by that multitude of waters that flow dayly into it, as it must of necessity be, unless they did by occult cavities of the earth return to their Fountaines, as is declared in the fore cited place by the wisest of Philosophers.

sophers. Neither is *Aristotle's* imputing the wasting of the Sea to the Sun and winds, of any force to perswade to the contrary; for although this kind of wasting may be granted in part, yet if it should be according to his judgement, his whole Element of water had bene long since consumed.

Obj. Seeing the Sea according to its situation is lower than springs (for the course of water is downward) how then doth the water thereof ascend so high as the heads of springs, especially those in high Mountains, and Hills?

Sol. I shall first shew after what manner it doth not ascend, according to the opinion of some, for there are divers opinions concerning the causes of its ascent.

1. It is not forced upward by a spirit, or breath that is in the water it selfe, as *Pliny*, and *Vallesius* supposed. For if it should be granted that there were any such intrinsecal impulsive spirit, or breath in waters, as it can not rationally be (for it is not observed that the Sea is moved any other way but by tempests sometimes, and the Moon by way of tide) yet that could not (though assisted extrinsecally by strong winds blowing contrarily, and that in an open Sea,) force them to the height of springs, much lesse could it alone in subterranean crooked channels.

2. Neither doth the weight of the earth force it up, as was the opinion of *Bodinus*, and *Thales*: For the earth, seeing it is a solid,

and firme body, doth not lye upon, and presse the water, but contrarily, the water the earth : Neither is the earth held up by the water, but the water by the earth, as you may see in all Rivers, Lakes, Pits, and the water of the Sea it selfe, when it is in channels of the earth. For if they should not at any time be quite full, as it sometimes happens, the upper part alone proves empty, which would not be if the waters were pressed by the earth, but contrarily.

3. Neither doth the weight of the Sea force it self up as was the opinion of *Seneca*, who supposed that the greatest part of the water of the Sea is out of its place, viz. above its place in the place of the air, and so above the heads of springs, towards which it forceth it selfe by its natural descent, and so riseth up again as high as the level of the water from whence it came ; but he proves it not, onely he asserts it.

But Doctor *Jorden* in his treatise of *Baths* being of the same opinion as touching the Seas being higher than the earth (though he holds that the natural place of the waters is above the earth) seemes to give some plausible account of it : For saith he, although neer the coasts it be depressed, and lower than the shoare, yet there is reason for that, because it is terminated by the dry, and solid body of the earth, as wee see in a cup or bowle of water filled to the top wee may put in a great bulk of silver in pieces, and yet the water will

not

not run over, but be heightened above the brims of the bowl, the like, saith he, we may see in a drop of water put upon a table, where the edges, or extremities of the water being terminated by the dry substance of the table are depressed, and lower than the middle like a halfe globe: But take away the termination by moistening the table, and the drop sinks even to an evenness. And whereas we see, saith he, that Rivers run downward toward the Sea *per declive*, it doth not prove the Sea to be lower than the Land, but onely neer the shoar where it is thus terminated, and in lieu of this it hath scope enough assigned it to fill up the Globe, and so to be as high as the Land, if not higher. Now if I should graunt that the Sea were higher in the middle than the highest place of the Land, yet it is very improbable that it should force it selfe to the tops of Mountains sooner than into Rivers which are far lower than the head of Springs, and more open than the narrow channels, and veines of the earth, through which it must passe to the Springs. And for that similitude of his concerning the termination of water by drynes, it will not hold water, nay it rather makes against him, than for him, for he saith that this termination is taken away by moisture, Now let me demand of him, or of those of his judgment, whether or no many great Rivers terminated in the Sea be not a sufficient moisture for the taking away of the termination of the

water made by the dryness of earth, and so to make the globous Sea to sink to an evenness?

4. And as the water is not elevated by any of the three foregoing wayes of impulse, or forcing, so neither is it by any of these two wayes of attraction, viz by the power of the Planets, or by the earths sucking it in, as a sponge doth water, from beneath, and sending it to higher places; For the first, there can be no such attractive vertue demonstrated; and if there were, it would as well, and promiscuously extend a like to Valleys, and low Countreyes where wee see few Fountains, as well as to high Mountains, and Hills, from whence proceed the greatest Springs. As to the second, an attractive vertue, if there were any such here, attracts to this end, that the subject wherein it is, might consume, retain, or enjoy what is attracted, and over and above that, none, or at least not so much as would suffice for the making of Springs.

5. Neither are there such veins, in the earth through which the water should passe, as doth wine through crooked pipes or cranes which wine-coopers, and Vintners use for the drawing of wine out of one vessel into an other, through which the wine being once sucked, runs continually till all be run forth: For the veins in the bowels of the earth are not wholly, and throughout full, as of necessity they must be before water will ascend through them for
pre-

preservation of its continuity and the avoyding of a *vacuum*.

6. Neither is the water raised to the superficies of the earth by *Helmonts fabulum*, or virgin-earth, which he saith is a certain sand continued from the Center of the earth in divers places, even to the superficies of the same, and to the tops of some Mountains, which sand hath in it a vitality, and in which as in a vital abode, and natural place, the water, whilst it remains, is living, and enjoys common life, and knows neither superiority, or inferiority of place, any otherwise than the blood in the veines which flowes upward to the head, and downward to the feet : But moreover he adds, that when this water is let out of its natural abode, *viz.* the virgin earth, as blood out of a veine, it then doth like a heavy thing hasten to its Center, or *iliad*, *viz.* the Sea. Now for the confirming of this vitality in water, he brings in this distich of the Poët

— — — — — *undas*

Spiritus intus alit, vasti quoque marmoris æquor ;
Mens agitat molem totam diffusa per artus.

And he further adds that the sea hath in it a kind of life, because though the winds cease, yet it hath its spontaneous motions, and observes its tides according to certain observations that it hath of the course of the moon, as if it would rise to meet her. Now

let us observe the weight of *Helmonts* arguments ; and that indeed is little or none as I conceive , for first he doth not any way demonstrate that continuation of his virgin-earth from the Center to the superficies of the earth, much less the vitality thereof : Secondly for the vitality of water he onely quotes a poetickall fiction : and thirdly for the spontaneous flowing of the sea , it is noe more a demonstrative reason for the vitality thereof, than the loadstones attracting Iron a reason of the vitality of the same.

7 Neither is it rais'd upon that account of condensation, & rarefaction, which the learned Doctor *Flud*, endeavours to demonstrate by the experiment of his weather-glass. The air, & water, saith he, fill up all the cavities of the world , so that in what hemisphære the air, by reason of cold is condensed , there the waters are rarefied, and swell, as may be seen in the weather-glass, where the water is rarified, and raised highest , when the air is with cold most condensed ; as also in the swelling of springs in frosty-weather. Now although this his experiment of the aforesaid glass doth prettily illustrate the busines of condensation , and rarefaction in close vessels, yet it doth not demonstrate sufficiently the raising of waters from the deep subterraneanl channells to the superficies of the earth, for it is apparent , as I have shewed in the former part of this chapter , that some springs swell more in summer than in winter; Secondly

condly if springs do rise higher in time of frost than in hot seasons, it is onely either because some subterraneall vapours, which could not evaporate by reason of the earth being constringed with cold, are condensed into water, and so make for the present some small addition to springs, or because the subterraneall waters are rarified, and swell by that heat which is occasioned through the aforesaid binding of the earth, for we see by experience that springs are hotter in frosty weather than in summer. And thirdly because the water of that weather-glass if it were open at the top as the veins of fountains are, would not observe the nature of the season so, as to rise or fall accordingly, for that in a close glass it ariseth onely *ad evitandum vacuum*; and now rather than nature should suffer a *vacuum* by the airs being condensed, vapours and fumes would proceed out of the earth, nay the next adjacent warm air would come in as a supply to prevent a *vacuum*, sooner than water in the bowels of the earth could be rarified, which would not in an open glass be raised at all, though the weather were never so cold.

By these seven negatives it appears how the waters in the earth do not ascend, I shall endeavour to demonstrate how they do ascend to the heads of Springs.

It is absurd to think (being the same which *Aristotle* himself and his followers graunt) that

that the waters should not be elevated from the bottom of Caverns, to the heads of Springs after the same manner as water is elevated from the Sea to the middle region of the air. Now this elevation is done by the force of heat resolving the water into vapours. And if so, why then may not the other be done after the same manner, viz: by heat: Neither is it any matter whether that heat be above, or beneath the waters, if so be it forceth them into vapours, and maketh them ascend as high as is requisite they should. But it may be said that the middle region of the air is very cold, and it is coldness that condenseth vapours into water: but now the earth, through which these vapours pass, is warm, as is agreed by most. To this I answer, that it is not necessary that there must be cold for the condensing of vapours into water, it is sufficient if there be a more remiss degree of heat, as you may see in the head of an alembick, and the cover of a seething pot, the interior superficies thereof being full of drops, whilst they themselves are warm.

Now for the making of a vapour of any liquid matter, heat is altogether, and absolutely necessary, according to the opinion of all, and for much vapour there is much heat, and a considerable proportion of humour required. But seeing abundance of water comes from the Sea into the bowels of the earth, the subterraneall heat, which must be
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in like proportion, being the chiefest cause of the generations of Springs, is next, and diligently to be inquired into. Now that the earth is hot, it is known by daylie experience. And *Lucilius Baldus* saith, that the earth being newly digged is hot, & smoketh, and that out of deep wells is drawn warm water, and especially in winter season by reason of the cold binding the earth, and keeping in the heat: but how this heat comes to be in the earth, he speaks like a Stoick, and saith it is in it as naturally, as vitall heat is in animals. But this opinion is not so probable as that of the Peripateticks, who say that the earth is of it self, and naturally cold, because dense and heavy, but hot accidentally onely.

Now the great question will be from whence this heat of the earth doth proceed.

I will first shew from whence it doth not proceed, and thereby confute the opinion of some.

1. It proceeds not from the Sun, as many imagine, supposing that all heat in the world comes from thence, and that the earth being beat upon by the sun-beames, doth thereby receive into it self a certain heating vertue. But this is very improbable, seeing that they, that digg in the bowellsof the earth, observe that the heating power of the Sun, although in most hot seasons doth not penetrate the superficies of the earth above six feet deep: do not we see how a thin wall, or boughs of trees in an arbour keep off the heat of the sun, though

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never

never so great? to say nothing of the earths being colder two feet deep in Summer than in Winter.

2. It proceeds not from an antiperistasis of the cold air in the superficies of the earth, for this hath place no further than the heating power of the rayes came. Besides the naturall cold of the solid, and dense earth must of necessity have greater power to repell upwards, than the adventitious of the soft, thin, and light air to force downwards the heat of the sun, which indeed in all reason should, being generated but a little way within the earth of its own accord being very light ascend upward through the passage made by the Sun: and this we know that after a long Summers day, it is before the next morning almost vanished though never so great, much less will it be preserved till, and through the Winter. It must then of necessity be another kind of heat, & it is such, that towards the superficies of the earth is colder, as being more remote from its original, or beginning, and is in Summer-time by reason of the Suns opening the earth, and making vent easily, expired, and is therefore less perceived, but in Winters frost is restrained from exhaling, and is condensed, as may easily be perceived in deep wells.

Now to know from what principle this heat hath its original, or rise, we must examine whence proceeds the heat in hot baths, for there the subterraneal heat offers it self more conspicuous

conspicuous and apparent to our view.

But concerning the original of the heat of subterranean waters, there is as much doubt, as of the generation of those waters themselves. And therefore I shall in the first place endeavour to prove how heat doth not come, thereby confuting the opinion of some, and in the next place to shew which way it may proceed probably.

1. It is not caused by the heat of the Sun, and that partly for the reasons above mentioned, as also because then, those waters would be hotter in Summer-time, than in Winter.

2. It is not from the agitation of winds in the channels of the fountains, for if so, then they being vented forth, the heat would presently be extinguished.

3. It comes not from sulphur, *Calx viva*, (as is the opinion of many learned, as *Seneca*. &c.) and that because neither doth sulphur at all heat unless it be actually hot, nor *Calx viva*, unless whilst it is dissolving in water: to say nothing of that vast quantity, which would in a little time be resolved, and the sudden remarkable change that would be in hot springs.

4. It proceeds not according to *Doctour Jordens* opinion, from the fermentation that is in the generation of metals, and minerals caused by the agent spirit acting upon the patient matter, and so producing an actual heat (for *ex motu fit Calor* say all Philosophers)

phers) which serves as an instrument to further this work of generation ; For if it were so, then the heat in bathes would in time cease, for he himself saith that this fermenting heat continues no longer till the generation of them be finished, which is done in some determinate time, but we see that the hot baths continue for ever. Neither doth it suffice that he saith that generations of metallals are not terminated with one production, but the mineral seed gathereth strength by enlarging it self, and so it continually proceeds to subdue more matter under its government, so as where once a generation is begun it continues many ages, and seldom gives over, as we see in the Iron mines of *Illua*, the tin mines in *Cornwall*, the lead mines at *Mendip*, and the *Peak*, which do not onely stretch further in extent of ground, than hath been observed heretofore, but also are renewed in the same ground, which hath been formerly wrought, I say his saying thus doth not suffice, for though it be so as I do not deny but it may, yet notwithstanding he doth not say, that generation of metals continueth in one place, except any ground be digged first; and so space and place left for new matter to come, as is not in our baths, and so by consequence the flowing of hot water would cease in that place, where the said generation is not continued; and if that generation be extended further yet so also and accordingly is the heat diminished, unless

less it break forth continually in new places: but we see hot springs continue many years together in one place at a constant heat. Besides if this opinion were true, then where we see metals, and minerals generated, there also must of necessity be hot baths, but we see it is not so. I shall now moreover demand of him, how that crude metalline matter is before any the said fermentation sublimed from the central parts of the earth towards the superficies thereof, if not by a subterraneall fire?

All these being excluded, it remains now that we consider of a subterraneal fire onely, for it seems impossible that so great, and durable a heat should be caused, or preserved by any other power whatsoever, than that of fire, and of this opinion was *Empedocles* an ancient Greek Philosopher, and also *Seneca*, but both these differ amongst themselves as to the manner of the heats proceeding from this fire, and indeed from other Authours that seem to be more Authentick. The one is of opinion that it is sufficient if the fire be under the place, through which the waters run, and so like fire under a still force up the water by way of a vapour: the other that the heat proceeds from some occult remote burning and passed through the veins, and fibres of the earth where it meets with the waters, and distill them up to the heads of the fountains. But *Agricola* excepts against these two ways as being very impropable; the first, be-

cause the earth, where the fire is, could not endure the fire so long, being of a calcinable, & cumbustible nature: the second, because by this way such a quantity of water could not be so heated as to be turned into a vapour so suddenly, by so small a degree of heat.

There can therefore no other reason be given for these hot springs, than the fire which burns in the very cavities, and caverns of them, the cavities themselves consisting of a Bituminous matter. For Bitumen, and these things which are made of it being kindled burn in water, by which also the said fire is cherished: This you may see in *Naphtha*, which is a kind of Bitumen, for if you put but a drop thereof into water, and put fire to it you will see it burn, and continue burning so long, that you would wonder at it, which could not be unless it were fed by the moisture of the water, which it did attract, and transmutes into its own nature; The like you may see in *Champhir*, and other kind of Bitumen. *Pliny* also affirms that these are some certain burnings in the earth, which sometimes cast out Bitumen, and are increased by raine. And *Fallopins* saith that in the territories of *Mutina* is a short plat of ground, out of which comes fire and smoke, and the ground is all like dust, which if you kindle, you cannot quench again with water: so that these kind of fires are perpetual, and very long lasting in waters. And hath it not been observed that a fiery Bituminous matter doth

doth sometimes flow out of hot Springs? *Pliny* makes mention that in the City *Somafata* of *Comaganes* a certain lake sent forth burning mud: and *Plato* makes mention of the like concerning a Spring in *Sicilia*: And *Agricola* reports another upon his credit. *Fallopious* also saith that in many places where the earth is digged deep, there are ashes, and calcined stones, which are the effects of fire, and that in the territories of *Modena*, *Bolonia*, *Florence*, and other places, as in *Italy* &c, there are found Springs and several places casting out fire. But as to Springs, this happens onely where the bituminous matter is very near the Spring head, and as high, and where the veins are more open.

Now then the manner of Springs being caused by this Bituminous fire is this, viz: Seeing art doth for the most part imitate nature, the thing is even the same in a hot Spring, as in a distilling vessell, or a seething pot covered with a lid; onely there is this difference, that to the bottom of these the fire is put on the out side, but here the fire is within the cavern it self ththrough which the water passeth, and that either lying in the bottom, or sticking to the sides thereof. As therefore in these artificial vessels the water being by the heat of fire resolved into a vapour is forced upwards to the covers or heads thereof, where by reason of some less degree of heat it is condensed into drops, and returns to its self, and into its own nature

ture again: So even after the same manner water in the caverns of the earth being heated by the Bituminous fire, with which it is mixed, is by the heat thereof forced into a great quantity of vapours, which ascending through the cranines, veins, and fibres of the earth being there for the greatest part turned into water, doth with the rest of the vapour yet very hot break forth in fountains viz: very hot, and very full of spirit, so that it seems to boyle, if the fountains be near to the caverns, or onely warm, if more remote. And as these Springs differ in their heat according to their nearness, or remoteness to their fire, so also in their Bituminous odour, and tast. For as in distilled waters their *Empyreuma* vanisheth in length of time, so in these in length of course: So that these fountains, which are very remote from this Bituminous fire, are neither, hot, nor have any Bituminous odour. And as by this natural distillation water is the best way procolated from its Sea saltness; so also doth it become thereby less obnoxious to putrefaction: For we know that distilled waters last longest.

Ob. It may be objected, that if the matter preserving this fire were Bitumen, then it would follow, that almost the whole world should be Bitumen, because ever since, and before the memory of man these hot baths were, and are like to continue for ever, and therefore there must be that element for ever which must preserve that fire.

Sol. It doth not follow that there must at present be so much Bitumen as will maintain the fire so long, for it is perpetually generated, and as long as there shall be ficcidity, and humidity in the earth, there will be Bitumen generated: And do not we see that metals are generated a new in the same places, out of which they have formerly been digged? Witness the profit which *Fallopins* saith the Duke of Florence hath by it; and the testimony of learned *Sendivogius*, who saith that there have been metals found in mountains where formerly there have been none. If so, then much more may sulphur and Bitumen be generated a new.

Ob. If it should be granted that Bitumen is generated a new, yet, if that were the aliment of the fire, the fire would change its places, because the Bitumen is consumed one part after another, and so by consequence the baths would not be so equally hot as before, the fire being by this means more remote from the fountains

Sol. The flame is fed two ways, either when the flame follows the matter, as when the fire burns wood, or when the matter follows the flame, as in a lamp, in which the oyle follows the flame, not the flame the oyle; and so it is in the earth, and therefore the fire is always in one place. Neither doth that withstand it, which we see by experience in sulphur which is burnt part after part, the fire following of it: for you must know that

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in the earth where there is a great heat, the Bitumen and Sulphur are melted, and by this means follow the flame, as I said before of Oil.

Ob. If Bitumen feed the fire of these baths, then the waters thereof would have the odour, tast, and colour of Bitumen; but it appears that they have not.

Sol. Though all baths are heated by Bitumen, yet some immediatly, as those which do pass through the place where it burns, & these onely have the tast, and odour of the same: and some mediately, as those that pass through places, as rocks, &c. heated by Bitumen, burning under them, as was the opinion of *Empedocles* and *Vitruvius*. Neither do I by this distinction contradict what I said before, concerning the waters being distilled up by that fire onely which burned in the caverns, and veins of the earth, through which they pass: for in this place I speak onely of the waters being heated, this mediate heat not being sufficient to distill them to any considerable height.

Ob. It is very improbable that any subterranean fire can burn within the bowels of the earth by reason of the want of air, as we see in cupping glasses, where as soon as they are applyed, the fire goeth out; besides the fuliginous vapours would recoil and choak the fire, for there are few, or no vents and exhalation seen.

Sol. There is not any such great want of
air

air in the earth, nay there is such a plenty of it there, that many learned Philosophers were, nay; *Aristotle* himself of opinion, that all Springs were generated of subterranean air.

2. Air is not the aliment of fire, for saith the *Lord Bacon* in his Treatise *De vita & morte*. *Flamma non est aer accensus*, flame is not kindled air; nay, but unctuous vapours, which arise from the matter that is burnt, so that whereas without air fire goeth out, and is extinguished, the reason is, because the fuliginous vapours wanting evaporation, do recoil upon the fire, and choak it. Now this Bituminous fire is not, being of a sulphureous nature, very fuliginous, and besides what smoak or fumes or vapours there come from it are subtile, and penetrating, and either evaporate through the superficies of the earth insensibly, or incorporate themselves with some suitable subject that is in the earth, or els are of themselves condensed into some unctuous matter adhearing to the sides of the caverns into which they are elevated. So that according to the fuliginousness of vapours more or less recoiling, the fire is more or less choaked. Nay if we will believe *Historians*, there have been burning Lamps closely shut up in glasses for fifteene hundred years together in old sepulchres; Now they burnt without air, & were not extinguished by reason the aliment of it was a Naphtha, or Bituminous matter, which was so pure that it bred no fuliginous vapours to choake the fire thereof.

3. Where this fire is very great, there is a great vent, and exhalation, but where but little, little is the vent, and insensible. And in most places the fire is not great extensively, but intensively, because it is kept within a narrow compass, as in small caverns and veins of the earth.

Q. How comes this Bitumen to be kindled in the earth?

Sol. It is agreed by all that are of the opinion that Bitumen is the matter of the subterranean fire, that hot and dry exhalations in the bowels of the earth being shut up, and not finding any place to break forth, are agitated, attenuated, rarified, and so inflamed, and being inflamed kindle the Bitumen.

Now lastly let no man wonder that there should be so great a force of fire contained in the earth as to be sufficient for the generation of so many Springs that flow from thence daylie, seeing *Pliny* and many other Philosophers wonder so much on the other side, when they considered of the subterranean fire, and brake forth into an exclamation, saying, it is the greatest of all miracles that all things are not every day burnt up. And cannot the burnings of the *Ætnean*, *Visuvian*, *Nymphæan* mountains convince us a little of this? But for the further confirmation of this opinion, let us a little consider whence the winds proceed, and what they are. And are they not a hot and dry exhalation? Now that this proceeds from, and out
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of the earth, most agree : and that it entered not first into the earth is very probable : For how can a hot, dry, light exhalation, whose nature, and property is to ascend ; descend into the earth in such a quantity, as to cause such great and lasting winds, as many times happen ? It must therefore be in the earth originally, and be stirred up by some great heat in the same. And what shall we think of the dry exhalation or spirit which is shut up in the caverns of the earth in great quantities, and endeavouring to break forth through obstructed passages causeth great earth-quakes whereby Cities, Towns, and Countries have been overthrown, to say nothing of those dreadful noises sometimes in the bowels of the earth ? Whence I say these great exhalations (I say great, because I confess that some little quantity of them may be caused by certain fermentations in the earth) should be raised, if not from some great heat of fire within the earth, never any one yet could rationally determine.

And *Cæsius* affirms that at a certain village called *Tripurgulus* about an hundred and twenty years since, after fifteen dayes earthquake the earth opened, and winds, smoak, and very great fires brake forth out of the same, also pumice-stones, and abundance of ashes, in so much as they made a mountain, and about that place were many hot Springs. Also in *Apulia* is a hot bath called *Tribulus*, where there is abundance of ashes

and calcined stones ; and about the lake *Lucrinus* and *Avernus* are the same.

But if any should yet doubt that winds proceed from the earth or from the occult fires of the earth , I shall make it yet further to appear by propounding to their consideration some observations concerning the Sea. For it is observed that wind doth proceed from the Sea, after a more apparent, and violent manner, than from the land, and that more certain signes of an ensueing wind are taken from the Sea, than from the land. For when a calme Sea makes a murmuring noyse within it self, it signifies that then the exhalations, which is the matter of the wind are rising out of the earth, and bottom of the Sea; and this the fishes perceiving, and being affraid of it, especially Dolphins, play above the water, and the Sea-urchins fasten themselves to rocks: the Sea a little swelling sheweth that the exhalation is endeavouring a vent; then boyling sheweth that it hath penetrated to the superficies, but as yet in a little quantity: but then the erupitious of the exhalations following upon the waters mounted up aloft, make wind, and a tempest; such as Marriners have often experience of, when as they perceive that the wind blows from no other place, but ariseth at themselves. Now why waves or billows should preceed wind; let any man if he can give any other reason.

Allo I have been informed by some Marriners

riners, that a little before a great tempest there is seen a great quantity of an unctuous shining matter floating on the top of the Sea, and that this is an infallible signe of an ensuing storme. The reason of this is because wind breaking forth out of the earth, forceth up with it self that Bituminous matter from the place where it self was generated.

But now why winds should arise from the Sea more apparently than from the land, is because there is more plenty of fire in the gulfes of the Sea, for there it hath more aliment or fewel, viz. Water, which as I said before, is the aliment of that Bituminous fire. And whence are those great mountains of stones and minerals, and those Islands, which do sometimes arise up anew from the Sea, but from a subterranean fire, which forceth them up from thence (according to the judgement of learned *Sendivogius*, and experienced *Erker*) and those chalmes, and gapings of the Sea?

Much more, might be alleadged for the confirmation of this opinion, as the manner of the generation of minerals, and metals, and many such like subterranean operations, which can not rationally be ascribed to any other cause, than fire within the earth; but all the premises being seriously weighed, & impartially considered, I suppose there are but few but will conclude, that as all Springs proceed from the Sea through subterranean channels and caverns, so also are distilled up to the heads

heads of Fountains by a subterranean bituminous fire. And as for those that are not yet satisfied let them consult with the treatise of our late, and learned Countryman *Mr. Thomas Lydyat*, entituled *Disquisitio physiologica de origine fontium*, and there they shall find this opinion rationally discussed, and solidly confirmed: but if yet they shall be left unsatisfied, let them produce a more rational account of any other opinion, that will hold water in all respects better than this of mine doth, and I shall thanke him and embrace it.

And thus much for the original of Fountains in general, I shall now proceed to treat of the nature of Springs in particular.

CHAP. III

Of the strange variety of Fountains, and other Waters.

Nature hath not discovered her selfe so variously wonderful in any thing as in the Waters of Fountains, Rivers, &c. Some of which strange waters I shall reckon up, that it may be the better conceived how variously subterranealls communicate their vertues to this Element. Now the wonderfulness of waters that I shall mention, consists either in the strangeness of their colours, tastes, odours, sounds, weight, observation of time, & effects.

1. Strange

1. Strange Colours. *Athenæus* makes mention of a Lake of *Babylonia*, that in Summer-time for some few dayes is red.

He also saith that the water of *Borysthenes* is blew in Summer-time.

Pausanus mentions a certain water at the Town *Joppe* and in *Astyris*, that is yellow.

Cardanus speakes of a white water in the River *Radera* of *Misena*.

He also sayes there is a green water in the Mountain *Carpatus*.

He makes report of a black water in *Allera*, a River of *Saxonia*.

Scaliger reports that the Fountain *Job* in *Idumea* changeth colours four times in a year.

2. Strange Tafts. *Agricola* makes mention of sweet water in *Cardia* neer *Dascylus*, and *Puteolana* neer the cave called *Sybill*.

Aristotle relates of a water in *Sicania*, of *Sicilia*, which is used instead of vinegar, and pickle.

Rulandus also makes a report of a soure water in *Mendick* and *Ponterbon*.

Cæsius speakes of a bitter and salt water in *Palastina* in which Fish can not live, of the same taft is the sulphur Well in *York-shire*.

Causinus saith that the River *Hyspanis* is as sweet as Honey in the beginning, and acide at the end.

Pliny relates that in the country of the *Troglodytæ*, there is a Spring called *Fons Solis*, (i.e.) the Fountaine of the Sun, which alters its taft according to the rising, and setting of the Sun.

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Mutianus saith that the Fountain *Diotechno-*
sia in the Isle *Andros* hath the tast of Wine.

Salt waters in *York-shire*, *Spain*, *Italy*, *Sicilia*, and divers other places.

Nitrous water in *Lotis* of *Macedonia*, and at *Epsome*, and *Scarborow*, &c.

Astringing waters, as Alluminous, and *Vitrioline* almost every where.

Corroding water is in the River *Styx*, the water whereof being put into a Silver, Copper, or Iron vessell, corrodes its way through the same.

Fat waters as they are tastable may be mentioned in this place, and many of this sort saith *Cesius* are in *Germany*, *Italy*, *Macedonia*, and other places.

3. Strange Odours. *Pausanus* saith that in *Peloponnesus* is a water that hath a very fragrant smell.

He also saith that in the Town of *Elis* the water of the River *Aniger* is of such a horrid smell, that it kills both man, and beast.

Aristotle makes mention of a water not far from the River *Aridanus*, which is hot and sendeth forth such a stanch the nothing can drink of it, and kills all birds that fly over it.

Cesius reports of *Arethusa* a River of *Sicilia*, that it smells like dung at certain seasons.

The Sulphur-Well in *York-shire* smells like the scouring of a Gun that is very fowl.

4 Strange Sounds. *Pliny* makes mention of a Fountain of *Zama* in *Affrica*, that makes melodious sounds.

Vitruvius

Vitruvius reports that a Fountain in *Magnesia*, hath a tunable sound.

5. Strange Weight, and that either in relation to themselves as being heavy, or light, or to other things put into them.

Plutarch makes mention of a River called *Pangens*, a vessel of the water whereof weighs twice as heavy in Winter as in Summer.

Strabo saith that the water of the River *Euleus* is fifteen times lighter than any other water.

Seneca writes that in *Syria* there was a Lake called *Asphalites*, in which no heavy thing could sink.

Cæsius saith that the Lake *Alcigonius* in *Lerna* is of that nature, that if any go into it to swim, he should certainly be drowned.

Strabo writes that amongst the *Indians* in a mountainous Countrey there was a River called *Silia*, on which nothing could swim, which River saith *Causinus* is an emblem of ambition, because it will suffer nothing to be above it. Some Rivers run over Lakes and will not mix with them, as *Marcia* over *Fucinus*, *Addua* over *Larus*, and divers other there are of this nature.

Some Rivers run under the bottom of the Sea, and will not mix with it, as *Lycus* in *Asia*, *Erasinus* in *Argolica*.

Athenæus saith that in *Teno* is a Fountain that will not mix with Wine: but will fall alwayes beneath it.

6. Strange observations of times.

Cardanus mentions a Spring called *Fons Sabbaticus*, that flowes all the six dayes of the week, but is dried up the Sabbath day.

Causinus relates that the Fountain *Vmbria*, flowes onely against a time of famine.

Ovid writes that the water of *Pheneus* is unwholsome by night, but wholsome by day.

Solinus reports that in *Helesina Regione*, a Fountain otherwise still and quiet doth at the sound of a pipe rejoycingly exult and leap up.

Ovid saith that the Fountain of *Jupiter Hammon* is cold by day, and hot by night.

7. Strange effects.

The River *Styx* kills all them that drink of it, as is agreed by all Historians.

Strabo writes that in *Palestina* the Lake *Gardareus* makes the nails, horns, hair, fall off from those beasts that drink thereof.

Pomponius Mela saith in *Insula Fortunata* is a water that makes them that drink of it to laugh to death.

Pompeius Festus reports that the Fountain *Salmacis* inclines men to venery.

Vitruvius relates that the Fountain *Clitorius* makes them that drink of it to abhor wine.

Ovid saith that the Fountain *Lyncestis* makes men drunk.

Pliny makes mention of a Fountain that makes men mad.

Pliny reports that the *Dodonean Fountain* will

will quench lighted torches, but kindle those that are extinguished.

Heurnius saith that he saw amongst the *Eugeneans* a certain Fountain that would turn divers things to stone, that were cast into it : *H. ab Heers*, and *Doctor Jorden* reckon up many of this nature, whereof some will couvert things into stone in a short time, and some in a longer, and some onely crust over things as that dropping Well at *Knareborough*, unles it sinks into things, as leaves, mosse, and all those it converts to a stoney substance.

Maginus makes mention of a Lake in *Ireland*, in the bottome whereof if you put a staff, it will being pulled out some moneths after, be turned into Iron viz. that part which stuck in the mud, and that part which was in the water into a whetstone.

Aristotle mentions a certain Fountain in *Sicilia*, into which if living creatures being before killed, were put, they would become alive again.

Athenæus saith that the fish of the River *Clitoris* have a certain voyce.

Solinus speaks of a Fountain that is in *Bœotia*, which helpeth the memory.

Isidorus saith the like of the River *Lethe* which causeth forgetfulness.

Scaliger saith that the River of *Juvena*, is of that nature, that the leaves of a certain tree hanging over, falling into it, become living fishes.

Pliny reports that in *Agro Carrinensi* in *Spain* is a certain Fountain, which makes all the fish that live in the water of it seem to be of a golden colour.

Agricola affirms that fishes live in the hot Sulphur-waters of the lower *Pannonia* neer *Buda*.

Varro, and *Solinus* affirm that there is a Fountain in *Arabia*, which, if the sheep drink thereof, changeth the colour of their fleeces, and maketh the white to become black.

Pliny reports that the water in *Falistro* maketh the Cattle that drink thereof, to become white.

He also saith that in *Pontus* the River *Astaces* watering the fields, makes the Mares that feed therein to yield a black milk, which feeds the Countrey.

It is reported that in *Ulcester* in *Ireland*, there is a Fountain, in which he that washeth himself shall never become gray.

I could reckon up many more waters of very strange natures, but whether they, or these already mentioned be all certainly true, I will not undertake to affirm, onely thus much I will say, that some of them, I myself have seen, other some I am assured of from those whose unquestionable worth may justly command mine, and other mens faith to their undeniable testimony, and for the rest we may believe them according to the reputation of the Historian. These here I mentioned that it might not seeme strange to us,
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how capable waters are of receiving diversity of qualifications from the earth : and although some of them may seem magical, and supernatural, yet may they upon a profound enquiry be made to appear truly natural.

CHAP. IV.

Of the nature, and vertues of simple Waters.

It will be necessary for the better conceiving of the nature, and vertue of mineral waters in particular, to speak something of the nature, and vertues of water in generall, or of simple water, which is an element, as saith *Sendivogius*, most heavy, full of unctuous flegme, and is more worthy in its kind than the earth; it is without volatile, but within fixed; cold and moist, attempered by air. It is the *Sperm* of the world, in which the seed of all things is preserved, and it is the keeper of every thing. It is called by the ancients *Πνεύματις*. *Thales* as saith *Aristotle* called one and the same water the beginning of all things. *Empedocles* also believed that of water were all things made. *Hippon* also saith *Aristotle* called it the soul of things, as if it were the life of them, which made *Hippocrates* say that water and fire were the principles of life, and especially water, for saith he, many animals may want fire, but none can well live without water. *Theophrastus* affirms that water is the matter of all things. And indeed

deed if water were accurately anotamized you should clearly see that both vegetables, minerals and animals are generated of water, but of this I have treated more largely els where: I shall not now stand to repeat, especially since my purpose here is chiefly to speak of the medicinal virtues of water.

Now we must know that water is twofold, for either it is simple or mineral, which we more usually call medicinal. Water is called simple, not according to its own nature, but to our sense, or being compared with that which is mineral, and of this there are five kinds, viz. rain, fountain, pit, river, and standing water.

I shall not here stand to prove whether or no water be nutritive, or be onely a *vehiculum* of aliments, as *Galen* would have it, because in another treatise I have cleerly shewed how vegetables, animals and minerals are generated of, and increased by water, which hath such strange dissimilarity, or heterogeneous parts as can scarce be believed by those who never saw the spagyricall anatomy thereof, or curiously examined the production of all natural things. I shall insist onely upon the medicinal use thereof, as being administred either to prevent or cure the distempers of the body.

Simple water which cooles, and moistens, is either taken inwardly, or used outwardly. It is taken inwardly either warme, or cold. The vertues of warme-water taken inwardly

wardly are these, which follow. viz.

1. It doth by reason of its warmth cause nauseousness, and it is drank in a greater quantity to cause vomiting in head-ach proceeding from drunkenness, and in any other illness of stomach; but with this caution, that they that have very cold, weak and laxated stomachs must abstain from this kind of vomit, because warm water doth moisten very much, and so by consequence would laxate the stomach more than it was before. Also it is not to be administered to those that are accustomed to drinking of water, for them it will not move to vomit, but remain in the body, and weaken the vessels upon the aforesaid account of its extreme moistening.

2. It allayes sharp, acid, and gnawing humours, and cureth such symptoms as proceed from thence, as saith *Galen*; also it represseth the ebullition of choller, and helps the inflammations of the throat, and mouth caused thereby as saith *Aetius*.

3. It cures the inflammation of the reins by altering of them, if it be taken before meals.

Note that if warm water be given to cause vomiting, it must be administered to the quantity of a pint or two, or of as much as will be sufficient thereunto. But if it be used for qualification it must be taken to the quantity of a cup onely, which may not cause nauseousness.

The use and vertues of cold water are these viz.

1. It conduceth to long life in regard it condenseth the spirits saith the *Lord Virulam*. And indeed water was the usual drink of the ancients who lived long.

2. It repels by reason of its coldness, and is therefore effectual against divers distempers; it forceth crudities out of the stomach, and as saith *Aetius*, promotes the operation of any medicine that is taken, and works not: besides it suppresseth the fuming of vapours to the head as saith *Diascorides*, and *Mesues*, and being drunk at bed-time causeth quiet rest, as saith the *Lord Virulam* in his learned treatise *de vita, et morte*, by suppressing the ascent of vapours to the head.

3. It allayes extream hot distempers, whether they be in any particular part, as in the stomach, liver &c, or in the whole body, as in continual, and burning feavers. It is upon this account commended by *Galen* against an inward *Erisipelas*. I know some that account it, especially rain water, as a great secret against ulcers of the reins.

Note that cold water is prohibited from a cold temper either of the whole, or of principal parts, also from old age, because it is very feeble, and from child-hood because it is subject to convulsions as saith *Galen*, and from a thin habit of body extenuated by reason of scarcity of blood, which is a great, and the principal safeguard against cold things

things. Winter also, and a cold, crass slimy morbidick, or a hot impact matter, as also great obstructions of the vessels, and cold inward tumours forbid the use of cold water.

As for the time when cold water is to be drank, note that it is never to be admistred in fevers, unless concoction do first appear, as saith *Galen*, for although it be a remedy for a feaver as it is a feaver, yet it is not a remedy against the humors which cause a feaver, but as it evacuates them by Urine stool, or sweat. But these cannot safely be expelled before they be concocted. Now we must notwithstanding expect a perfect and full concoction, but it will suffice if it be moderate and in good part performed, for else there will be a danger of the feavers turning into a Hectick. Also it must not be taken on the critical day, for then saith *Hippocrates* we must not move the humours, because we do not certainly know which way nature will attempt an evacuation. But for a more particular time of the feaver it is to be taken most conveniently in the fit, or in the very hour of the ebullition of the humours, because then the inward parts do burn most, and need most then to be qualified, besides coldness is then least offensive, because the greatness of the heat is a safeguard against the offensiveness thereof.

As for the quantity to be drunke, note that if the repelling, or suppressing vertue thereof be required, it is to be taken to the quantity

quantity of halfa pint, more or less as things may be considered. But if the altering or allaying vertue, as in a feaver, then it is to be taken in such a quantity as may be drunk at one breath, or as much as the sick party needs for satisfaction, or els can well bear. But the greatness of the distemper, the age, time of the year, custome, and strength is also to be considered.

But it will be demanded which is the best water, and most wholsome; and for answer hereunto, I say that is the best which is void of taste or odour, is clear, pure, most light, is soon heated, and soon cooled, and in which flesh is soonest boyled, and in particular as saith *Galen* rain water is the best, but yet not any, but such which falls in Summer-time when the heaven is in great part serene, and especially with thunder, being that which consists of thinner vapours, elevated and purified by the heat of the Sun and lightning. And next to this is that pit water, which flows from the next fountain, or river especially through a sandy earth, because if the said earth partake of no other quality, it is percolated, made more thin, and becomes more depurated than other water. And in defect of these two, fountain and river water may be used, being indeed very good and wholsome, and indeed are by many accounted the best: but the worst of all is standing water as lakes, pooles. Now in case there can be got no good water, but onely what

is bad, than *Galen* would have that to be boyled, and cooled again, and so to be used. Thus much of the use and vertues of cold, and warm water administred inwardly.

It remains now that I speak two or three words of the external use of water both warm and cold, and of the effects thereof. Now water is used outwardly saith *Julius Caesar Claudinus* first by way of *Balneum*, or bathing the whole body, secondly by way of *inseßus* or sitting in water up to the navel, thirdly by way of aspersion or affusion (i.e.) sprinkling or pouring on, fourthly by way of *stillidium*, dropping or distilling. Fifthly by way of fomentation, and lastly by way of lotion or washing any part.

Bathes are either hot, or cold.

Cold Bathes were by ancient and modern Philosophers, and Physitians ordeined for divers uses. Many used them onely by way of exercise as for swimming in them, which the *Lord Verulam* in his learned treatise *de vitâ & morte* reckons up as one of those robust exercises, as he calls them, which makes the flesh hard, and compact, conducing to long life.

They are used also for the astringing of the body, and condensing the same, also as saith the aforesaid *Learned Vicount* for the closing of the pores of the body that are too open, whereby the hot air excluded from preying upon the body, besides they unite the *Calidum innatum*, corroborating the same by an *anti-peristasis* wherby by consequence it doth beget

a good appetite, cause a good digestion, excite the expulsion of excrements, repress a canine appetite, & other ill symptoms caused by the exolution of the skin, stop bleeding, the overflowings in women, and the gonorrhea, cure the *Hydrophobia* which is a symptome occasioned by the biting of a mad dog, and many sorts of feavours both intermitting, and continual; if the party make use of them when that fit is approaching, and there continue an houre or two.

Note that the use of cold baths is not for youths, because they hinder their growth, nor for old men, because that little heat which they have is thereby suffocated, nor for cold and thin women which have delicate bodies. because the cold penetrates too much into their solide parts, nor to any that be sick, unles they be of strong natures (for as cold baths doe wonderfully corroborate the *Calidum innatum*, or naturall heat if it be strong, so doe they on the contrary overcome it if it be weak) and the humours appeare to be concocted and fit for evacuation, and no principal part, or bones, nerves, brain ill affected, and the body free from convulsions.

Note also that when the intension is to be formed by cooling onely, and there is no need of moistening, then as saith the aforesaid authour of the *History of life and death*, the body is to be annointed with oyle with spissaments or thickeners that the quality
onely

onely of the cooler be received, and not the substance. Yet we must in such cases have a care that the pores of the body be not thereby stopt too much, for when any extrinsecal cold obstructs the body too much, it is so far from cooling it, that it stirs up the heat the more, by suppressing perspirations.

Baths also of hot or heated water are of great use ; but before I declare the uses and effects therefore, wee must consider that they are of three sorts, for either they are tepid, (i.e.) Luke warm, or moderately hot, or very hot water.

A Bath that is very hot dryes rather than moistens, contracts the skin, condenseth the pores thereof, so that neither any external humidity can be received in, or interral superfluities expelled forth thereby. So that there is no great use thereof, onely it serves for the contracting of the skin where it needs contraction, & where the use of a cold Bath may not be admitted safely for that intension.

A Bath that is moderately hot serves for divers uses, and is very necessary in several cases.

It draws from remote internal parts, and causeth hot humours to be digested into vapours, and openeth the pores, that the offensive humours, and vapours may be evacuated by sweat, and perspirations. It moisteneth a dry body and therefore, is very good in a putrid and hedtick seaver, in the itch, and scab, &c. attracts nourishment to the extreame parts,

parts, where before by reason of some defect it came not, allayeth the sharpnes of humours in the habit of the body, and upon all these accoûts serves as effectually, if not more, for most intensions, that almost any Physick is prescribed for. I shall onely add to these the great vertues that *Columella* attributes to Baths of hot water; for saith he, we do concoct our crudities by the use of Baths. And for this end they were much used by the ancient *Romanes*, who used a crude kind of dyet as of hearbs, and raw fruits, which bred crude humours in their bodies, and therefore needed some such help to concoct them, and by this meanes they became very healthfull, and of delicate bodies. But they must be used for the concocting of crudities with this caution, *viz.* that there be no seaver present, for then instead of concocting of them they will become by being stirred, more putrid, and by being attracted to the habit of the body, as of necessity they must by the use of hot Baths, obstruct the pores thereof, to the increasing of the seaver; and in case of a seaver, hot Baths must be used in the declining thereof as when concoction appears, and after purging of the grosse humours, abound in the first vessels, but in other cases *Hippocrates* commends Bathing as a preparative to purgations.

A tepid Bath cools as well as heats, and heats as well as cools, and serves for the same uses as a hot Bath doth but more remissly.

Note

Note that if the patient that is bathing be subject to faint, he must hold cold water constantly in his mouth, and drink ever and anon a draught of cold beer, or water.

I might here prescribe many rules and directions for bathing, or for the ordering of ones self before, in, and after bathing, but it was not my purpose to make a full, and large discourse of this subject, onely to touch it by the way, referring those that stand in need of bathing to their skilful Physitians for their directions,

To this kind of bathing, viz. with hot water, I might add the manner of bathing by vapour, which is when a vessel of seething water close covered hath proceeding from it a long pipe, which is fastened into a bathing tub, into which the hot vapours come upon the patient there sitting: but of this I have treated more largely in another discourse, and will not now repeat.

The second way of using water outwardly is called *inseffion* or sitting in water up to the navel, and this is used when the weakness of the body cannot bear a bathing of the whole body, and particularly it is made use of, if warm, for laxating, & mollifying the hardness of the belly, for provoking of Urine, the mitigating of the pains of the stone, and chollick, &c, and if cold, for the performing of the same intensions for the lower part of the body, as a cold *Balnenm* doth for the whole.

The four last ways of using water outwardly, as aspersion (i.e.) sprinkling, or affusion, *Stillicidium* (i.e.) dropping or distilling, fomenting, and lotion respect parts, with the like operations upon them (although with some kind of variety of application) as baths do the whole body. They that will understand more these external uses of cold and hot water, let them read *Claudinus* his treatise *de Ingressu ad Infirmos*, and *Galenus de tuenda Sanitate*.

Note that that water is best for outward uses which will bear sope best, and make the greatest some therewith.

And thus much for the vertues, and inward, and outward use of simple water, whether hot or cold, and that in brief, for I would not dwell upon this subject, as not being the chiefest that I propounded to my self to discourse of in this treatise, taking it in only by the way and for order sake, and the better illustrating of that which follows, and is principally to be here treated of.

C H A P. V.

Of the severall kinds of mixtures in mineral waters.

IT is graunted by all that there is some kind of mixture in all mineral waters: & indeed there are four kinds of things that are usually

ally mixed with these kinds of waters, viz. Metals, Minerals, Stones, and Earths; and of some of these, 1. Sometimes the vapours onely are mixed, viz. Such as arise from the fermentation, and dissolution of Metals and Minerals, and are mixed with the water that passeth by them through the veins of the earth. And concerning this, saith *Aristotle*, that the vapours of Minerals keep the tast, and odour of the Minerals from whence they proceed: but of this more fully in the *Chapter of the Spaw*. 2. Sometimes the juice onely of them, viz. Whilest they are in *principiis solutis*. And indeed gold can be mixed with waters no otherwise, because it cannot be corroded with the acid spirits of the earth, as other Metals can, having in it self when concocted, and perfected none of that esurine acid salt, which a subterranean aciditie will resolve and set at liberty to corrode the Metal with which it is *per minima* together with the embrionated Sulphur of the same conjoyned. 3. Sometimes the substances, and that after a threefold manner, for some are mixed with water so very close together, that from the mixture of them there results but one forme, neither will they ever or scarcely be seperated, and such are those that will not vapour away faster than the water it self is evaporated, neither remains in the bottom, but is all evaporated with the water. Some are mixed confusedly, Such as subside or fall to the bottom, if the water be

put into any vessel, that it may stand still. And lastly some are mixed in a way betwixt both, as salt; for salt and the water continue to be in one and the same form, but yet the salt will subside and remain in the bottom after evaporation of the water.

Now the cause of this variety of mixtion is either the difference of the heat that should unite, or of their abode together, or else of the aptness of the things, to be mixed, for mixtion.

This being premised, I shall proceed to relate where these Springs, and waters are found, which are impregnated with the aforesaid four kinds of Ingredients.

1. Of Metals

Gold is said to be found mixed with *Balne-
is Ficuncellensibus, Fabariis, Piperinis, &c.*

Silver, in a certain Spring in *Hungarie*, and in the Bath at *Bol. &c.*

Copper, in the Bath of *Saint Mary's in Fla-
minia in Thermis Cellensibus in Suevia*, and in many places in *Germany. &c.*

Iron, in Springs in *Agro Lucensi in Asatia*, in *Agro Calderiano* and divers in *England.*

Lead, in *Lorayne*, whence a certain Bath there is called *Balneum Plumbaceum.*

Quick-silver, in *Serra Mardena in Spain*, near the village *Almediea* in a cave, where they say are many wells infected there-with.

2. Of Minerals,

Sulphur is said to be found in *Thermis Pu-
reolanis*

teolanis, Aponitanis, & Badensibus in Helvetia,
and those at *Knareborow*.

Antimony, in *Germany*, and in a certain
Spring at *Meldula*, as also in divers other
purging waters.

Arsenick, and *Auripigmentum* in the lake
Avernus.

Bitumen, in the wells at *Baia Mutina* and
those at *Knareborow* called the *Sulphur-wells*.

Salt in *Balneis agri Pistoriensis*, & *Volater-*
rani and in the *Sulphur-well* at *Knareborow*.

Nitre, in *Agro Puteolano* of *Campania*, in
Egypt and divers other places where the wa-
ters are very nitrous.

Allum, in *Balneis Agri Senensis*, & *Lucensis*,
and in some Springs in the North of *England*.

Vitriol, in *agro Volaterrano*, and those *Spaw-*
wells in *Germany*, and these in *England*.

3. Of Stones.

Plaster, in a Spring of the Mountain *Grq-*
tus in *agro Pataviano*.

Lime-stones, in Springs of chalkie coun-
tries, where the water sometimes runs forth
white.

Marble, in a Bath in *agro Agnano*.

4. Of Earth.

Potters clay, in a bath of the mountain *Or-*
thonus.

Rubrick, or a certain red earth (for so some-
times it signifies) in *aquis Calderianis*.

Marle, in *Oaxes* a river of *Scythia*, &c.

But of all these by the way onely and for
method sake, and also for the better under-

standing of what is behind, and indeed is the chiefest subject of this present treatise.

CHAP. VI.

Of the Original of Vitriol, and the causes of Vitrioline waters, or Spawes, difference of them the one from the other, and the reasons of their different operations.

IN the first place I shall give a description of Vitriol (in which shall be declared the causes thereof) and explain the terms thereof, difficult and not obvious to every ones apprehension, as being not usual in common natural Philosophy.

Vitriol therefore is but an esurine acid Salt, of the embrionated Sulphur of Copper, or Iron, which attracting an acidity from air, or water is thereby opened, and resolved, and then corrodes the parts of the said metals, with which it is connate, the body of which compound, consisting of Pure Metal and superfluous Sulphur, and Salt, being thus opened is dissolved in water passing through the veins thereof: And this water thus impregnated is boiled to a Vitriol.

The difficult terms hereof I thus explain.

1. By embrionated Sulphur I understand
a su-

a superfluous sulphur, which is not the matter of the Metals, but connate onely with them for the embrional conservation of them, and after the perfection of the Metal is cast off in part by nature, and more fully by the refiners fire. *Paracelsus* explains it by a familiar example of a Nut. A Nut saith he *per se* is onely the kernel, which is not generated by it self, but together with the shell, and shales, which are superfluous, and serve onely for the embrional conservation of the Nut, that is, of it whilest it is in an *Embrio* or imperfect. And here by the way note that as every Mineral, Metal, and vegetable hath its distinct *Sulphur Embriionatum*, so every *Sulphur Embriionatum* is distinct from the true genuine thing generated, with which it is connate, as much as a form, essence, substance, and corporality differ the one from the other, and is but an impurity of its *Embrio*, and as it were as *Helmont* calls it, the secundine thereof.

2. By esurine salt I understand in this place (not the acid spirit of air, water, and subterranean sulphurous vapours, not yet coagulated or specificated, which also are sometimes called an acid or esurine salt, but) a certain acid vapour applicable to all Metals and Minerals, and connate with them in their *principiis solutis*, and *Embrioes*, and especially to those that abound with sulphur, as Iron, and Copper, and with them congealed into a saline principle, giving consistency to the *compositum*

positum, as sulphur doth coagulation, and is by Hel-mont for want of another name called the *esurine salt of an embrionated sulphur*. (But any one may call it what he please, if so be he understand it) and is resolved, and unloosed by an acid spirit contained in air, and water, which spirit is indeed the seed of salt (for in them *viz.* in air and water, are the seeds of all things, in the former as being therein imagined, as saith *Sendivogius*, as in the male, and in the latter, as being afterward by a circulative motion cast forth into the same as into their sperm (for he makes a subtile distinction betwixt seed, and sperm) wherein they are conserved, taking not upon them the nature of any specifical salt, untill they meet with some corporeal principles that are consentaneous to them) and is, when it meets with any saline corporeal principle in its resolving of it coagulated together with the same into a distinct species of salt, *viz.* into this or that according to the nature of the *compositum*; where this solution, and coagulation is made.

I shall for the better illustration of this nativity of salts, briefly shew how two of the four said salts, *viz.* Nitre and vittrial are made artificially, because this artificial process is performed in imitation of the natural production of them.

1. The process therefore of making nitre artificially is this, *viz.* Sprinkle distilled vinegar upon fat earth, as fullers earth, bole, marle,

marle, &c. beaten small, and let it stand for a few dayes in a cold place, and you will see pure nitre produced from thence. Or take any one of the aforesaid earths, and beat it small, and set it in a cold moist place for some weeks, and you will see the same effect. Now this latter way seems as much natural as artificial, and indeed it is just in imitation of nature: for we see that any fat earth, if it be covered from rain, and the Sun, so as it spendeth not its strength in producing of hearbs and plants, breedeth plenty of nitre.

Now note that in these kinds of fat earths there is at first observed no nitrous tast, neither can there from thence be extracted any nitre, but after they have continued a certain time in the cold air, do by a certain magnetick power of a nitrous principle, or saline unctuosity which is in them, attract an acidity, or rather acid spirit, which opens the bodies of those fat earths, and resolves the said saline unctuosity, and is therewith coagulated, (for the solution of the one, is the coagulation of the other) and after this manner is the nativity of nitre.

2. The process of making artificial Vitriol is manifold, I shall speak of onely two, and they are these.

1. Cast Sulphur into melted Copper, and there let it burn till it cease to burn any more, then presently cast the melted Copper into rain-water, which will thereby become green. This do so often till all the Copper

per be dissolved in the water: then evaporate the water, and you shall have a good Vitrial.

Note that it is an acid spirit in the sulphur, which opens and resolves the esurine Salt in the Copper, whereby the Copper it self is corroded, and fit for dissolution in the water.

2. Take Copperas stone, which is a certain Sulphurious glittering Marcasite, break to pieces a good quantity of them, and lay them in air, and rain, upon sticks over wooden vessels, and in a certain time the stones will be resolved by an acid spirit in the air, and water, and washed down into the said vessel with the rain-water, which will thereby become green, and yield upon evaporation a good green Vitrial: and after this manner do we make our Vitrial, or Copperas in *England*.

Now let it not seem strange to any one, that there is such an acidity in water, and air; for whence else doth Iron, and Copper, being put into water, or standing long in the air, especially in a cold Cellar contract such a rust as they do? Is not this rust from the aforesaid acid spirit, viz. of the air and water, resolving the esurine Salt in those metals, and making it thereby more corrosive, and more powerfull to corrode part of the metals themselves, with which it is mixed *per Minima*? And will not this rust being boiled in rain-water yield a Vitrial?

Ob. But some will object, and say, that this rust is caused not from the acidity, but onely from

from the humidity of the air, and water , resolving thereby the said esurine Salt.

Sol. This I will solve with a relation of two experiments, *viz.*

1. Take the above named Copperas stones broken to pieces, weigh them exactly, and lay them in a cold moist place , (but so that no rain come at them to wash away the Salt thereof , as it is resolved by the acidity of the air,) and after some moneths they will , by a certain magnetical power, attract a certain saline humidity, and fall into a black powder, which being well dried , and then weighed, will prove far more ponderous than before, which implies that there is an addition of something else than a meer quality , *viz.* the humidity of air, and water.

2. Take a pound of Salt of tartar , make it red hot, and weigh it exactly, then put upon it two pints of rain-water distilled, and evaporate it, then put on more, and evaporate that also , and then make the Salt red hot again, and weigh it, and you shall find it far heavier than before , which is caused by the said Salts attracting to it self that occult acid saline spirit , which was in the water, and fixing of it into its own nature ; and not by assimilating the water it self, which will never be converted into Salt any otherwise than as it contains a saline acid spirit , which is the onely thing coagulable in it.

Ob. Some again will object, although they do admit of this acid spirit in air, and water,

& say that in case the said acid spirit do corrode and dissolve the metals, it doth not follow that there is any such esurine Salt in those metals, as distinct from the pure mercurial, or other Sulphureous part of them, but say that it corrodes onely the said mercurial, and Sulphureous part thereof, as we see *aqua fortis* doth silver, and mercury, and *aqua regia* doth gold, and so becomes coagulated into a saline nature, and consistency.

Sol. The said acid spirit of the air, and water, can not corrode, or putrifie the pure metalline part of metals, for we see that mercurie is not corroded, and reduced into a saline nature thereby, and that gold doth never rust, and that because it is purified from all the said acid saline principle, and is not at all corroded, but by an *aqua regia*; and silver contracts but little rust, and that according to the small quantity there is in it of the said Salt. And for the superfluous embrionated Sulphur, that neither can be corroded by the said acid spirit, any otherwise than it contains in it that esurine Salt, for if we put pure Sulphur extracted from *Sulphur vivum* into *aqua fortis*, it will not be corroded thereby, much less then by the aciditie of air, and water, nay. *Theophrastus* saith, that if woods, and cords be smeered over with an unctuous oyl, which he prescribes to be made out of Sulphur, they will be preserved from putrefaction for ever, though they continue in the air, water, or earth: and the truth is, nothing can

can open and resolve Sulphur but oyl, being of a like unctuous nature with^r it, as I have oftentimes tried. There must therefore be another corporeal Principle, viz. of a consentaneous, suitable, and saline nature, that is apt for to be corroded and resolved, and to coagulate the said spirit.

3. Vitriol is made artificial after this manner, viz. Take an ounce of spirit of Sulphur, or vitriol, and put it into a gallon of rain-water, stir them well together, then put into this acid water half a pound of the filings of Iron, or Copper, and within a few hours the metal will attract the said acid spirit to it self, be dissolved it self thereby, and coagulate that. This being done decant the water, and calcine the said mixture in a crucible, and being powdered, put it into rain-water seething hot, stirring them together, and then all that being settled to the bottom, that will settle, powr off the clear green water, and evaporate it, and you will have a pure Vitriol.

Like unto this is the making of Vitriol, by sprinkling a considerable quantity of distilled Vinegar upon the powder of Steel, or Copper, and letting of them stand till the mixture grow very hot by fermentation, and be again cooled, and then putting it into rain-water seething hot, and proceeding as in the foregoing process.

Almost after the same manner is Verdigrease made, viz. by hanging plates of

Copper or Brasse over the hot vapours of Vinegar.

Now these three processes of making artificial vitriol being seriously considered, will clearly illustrate the nativity of natural vitriol, which is as I conceive after this manner, viz: by an acid subterranean spirit (whereof there is great quantity in some mines) corroding the veins of Iron, or rather Copper, which being thus resolved, and opened are by the water that passeth through them, dissolved, after which, this liquor is boyled to a Vitriol; and thus is made the Vitriol in *Danick, Hungarie, &c.*

Note that any of the said Vitriols, if they be made out of Copper, whether natural, or artificial, being distilled in a forcing furnace, yield oyle, and spirit, and the *Caput Mortuum* thereof dissolved in rain water yields a pure Vitriol, and the *Colcothar* that falls to the bottom of the said water, yields upon a refiners tast most pure Copper like to very gold; as doth Verdigrease, the Metalline parts thereof being purified from their feculencies by means of the foresaid corrosion and dissolution.

The nativity of Vitriol being thus premised, it will most evidently appear what are the true causes of Spaw water, viz. Of their Vitrioline tast, and odour. It will not now be a thing irrational to grant that all Spaw waters partake either of the corporeal, or spiritual parts of Vitriol.

They

They that partake of the substance of Vitriol are such, as when they are evaporated, leave behind them a Vitriol at the bottom, and such are the *Sevenir, Paubon, and Geronster Springs*, the two former of which *Helmont* said, he carefully distilled, and found nothing in them but the Vitriol of Iron, and like to this was a certain Spring within two miles of *Knareßborow*, the water whereof I distilled, and found in the bottom a Vitriol of Iron.

Moreover, betwixt these wells, which are impregnated with a corporeal Vitriol, there is a considerable difference; for some work upon the bowels mostly, and by stool, if not sometimes by vomit, and such are they that contain in them much Vitriol, whether of Copper, Iron, or both mixed together, as *Geronster*, and are more gross and corpulent, and the operation of these is much after the same manner as that of steel, which for the most part doth, the first dayes it is taken, cause a nauseousness in the stomach, and passeth away by stool all the time it is taken, and by reason of the harshnes it hath, is seldom attracted to, or passeth through the vessels of the second concoction: But they that contain little of the substance, but more of the spirit as doth *Serenir*, do pass the stomach, Liver, and other vessels far sooner, and with less disturbance than do the other. And they that partake of none of the substance, but onely of the spiritual part, or vertues, such as the Spaw-well at *Knareßborow*, of which particularly

cularly in the next Chapter, &c. are far more efficacious in many cases, especially where obstinate humours, and confirmed obstructions betwixt the stomach, and Liver, are not the causes of the distempers, for in such cases, such a Medicine must be administered, which way more strong irritate these vessels to eject those obstructing tartareous, and viscous humours, or at least dissolve and attenuate them, thereby making them to yield to more benigne purgatives.

Note also that these waters may, the more they are impregnated with the said corporeal substances, the further be carried without loss of their strength. The water of *Sevenir* is carried many miles, and into other Countreys without loss of its vertues, but that of *Paanbon* much further, and into further Countreys; we have it transported into *England* very frequently. Now the water of the Spaw in *York-shire* cannot be carried near so far; but yet further than most believe, as I shall declare in the next Chapter.

Now these differences, or varieties of impregnations arise either from the difference of the quantity of the acide spirit corroding, the difference of the fruitfulness of the vein of Copper, or rather Iron corroded, or the greater or lesser continuance of the course of the water already impregnated, through veins of the said Metals, whereby it becomes long yet more impregnated, if the course be continued.

Note

Note that the veins of the said impure Metals contain in them more esurine salt, and yield more natural spirits than they themselves when melted, and therefore communicate far more efficacious vertues than they do, I mean in many cases.

CHAP. VII.

of the Spaw-well near Knaref-borow.

A Bout a mile and a half from the said Town, West-ward, in a moorish, boggie ground, (within less than half a mile from which there is no considerable ascent) ariseth a Spring of a Vitrioline tast and odour, resembling much those ultramarine Spaws. The water of this Fountain springeth directly up from the sandy bottom; and this is no otherwise than that water doth, which passing through pipes in the earth (serving for the conveying of water, from a Fountain to a house or Town) doth break the pipes if they be obstructed, or force it self through them, if already broken, upwards through the superficies of the earth, and flows in the manner of a Spring. For in this place the subterranean veins, through which the water passeth, are either (if not there terminated) obstructed, or too infirm to contain the water of the spring, passing forcibly through them, and making a vent where it can.

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As for the vitrioline, and Ironish tast, and odour of this water, I need (in regard I have in the preceeding Chapter declared more at large the causes of all Spaws) speak the less in this place. But for more particular satisfaction, the aforesaid tast and odour may be imputed, partly to those vapours that proceed from the fermentation, that is in Iron, or Copper mines, and thus *Aristotle*, and *H. ab Heers*, would have it to be, affirming, that vapours retain the tast and odours of their minerals, and the water with which these vapours are mixed become thereby impregnated, though in a more remiss degree, with the same qualities: partly to the long abiding, or continuing of the water with the Iron, or Copper mine, viz. in some great cavities in the midst of the veins thereof, whereby it contracts their odour and tast, as we see it doth in Iron, or Copper vessels, if it stand long there, especially if excited by heat, or acuated with any acidity, and as doth white wine standing long with scales, or filings of steel, or iron: or partly to the water acuated with some subterranean sulphurous acidity, and passing swiftly through some hungry barren vein of Iron, which it corrodes lightly resolving thereby some of the spiritual, and subtile parts thereof only, which it becomes it self impregnated with. And hence it acquires the nature of a Spaw-well.

Now for the better understanding of the nature

nature of this Spaw, I made divers experiments thereof, which are these.

1. I distilled it, supposing that if I could draw off the mineral spirits by themselves, I should discover a great secret, very advantageous for diseased people, but the water, yea, the two first spoonfuls, which were distilled, and the rest undistilled that remained, utterly lost, both the tast and odour, which they had before, neither would they become any otherwise tinged with galls than common Spring-water, although the water undistilled with the mixture of the pouders of galls, became as red as a well coloured Clarret wine. Now it is hard to conceive the true reason of this, especially since I distilled it in a glass still, and luted or closed up very carefully the joints thereof, so that spirit of wine could not evaporate out thereat. I impute it to the subtilty of those spirits, which are so volatil that they are sooner sublimed than the water it self, therefore becoming to be unbodied (for before they were incorporated with the water) and by consequence wonderfull spiritual, penetrate even the glass it self, or the lute, and I believe that neither glass or lute can hold them.

2. I took two viol glasses, and put into them a just equal quantity of the Spaw water, I put one of them into a skillet of warm water, and just took the cold off from it, than I put an equal quantity of the pouders of galls into each of those two viols, and that

water which was cold received no deeper tincture than the other as I could perceive.

3. I filled two vial glasses with this water, and stopt one of them very close with wax, and the other I stopt not at all, and at two dayes end they yielded a tincture with the powder of gall, little less than that which is newly taken out of the well, but that less, which was left unstopt. How much it will loose this tincture by carrying far, I do not know; it were worth while to trie, and thereby to be the better assured how much of its strength is wasted, for according to the spending of its spirits the tincture fades.

4. A glass of this water stood seven dayes close stopt with wax, and than yielded a tincture with gall, like to small beer.

5. This water doth not coagulate milk as do the *German Spaws*, and another *Vitrioline Spring* in the same moor, which yieldeth a Vitriol of Iron upon evaporation as I said before. Now the reason of this is not because it is not acide enough, for it is far more acid than the water of the dropping Well, which coagulates milk, if it be boiled with it, but because the acidity thereof is not permanent, or fixed enough, but so volatile as to evaporate before the milk boils.

6. This water kils Worms and Frogs, if they be put therein, and such kinde of Creatures as these.

7. It being evaporated, leaves nothing at all of

of Vitriol behind, but onely an insipid powder of a darkish colour, like unto which powder will that blewish cream or skin, which swims upon the said water after long standing, be when it is dried. Now note that the afore-said skin swimmeth upon all such Mineral waters, and as saith *H: ab Heers*, being put upon the fire is inflamed, and yields a sulphureous odour. It is also called by *Hadrianus Mysicht, Anima vitrioli*.

8. I weighed this water, I think exactly to a grain, and it weighed neither heavier nor lighter than simple spring water.

9. It is observed generally, and I tooke especial notice of it, that it is almost an infallible signe of an ensuing rain, when glasses filled with this water continue not clear, but are covered all over as it were with a mist, contrary to what is observed in glasses full of simple common water. Now the reason of this I conceive is from the Mineral subtile spirits giving, as nitre doth activity to the coldness of the water, whereby the glasses themselves become more cold, and so cold as eminently, and apparently to condense the humid vapours of the air, with which it abound before the rain.

To these experiments, and observations I shall add this observation also, viz. that this Spaw water is strongest viz. with the Mineral spirits in Winters frost, by reason of the earth being the more bound up, and the said spirits being thereby kept from

perspiration: and weakest in rainy wet weather by reason the water sinks into the veins of the springs, viz. those that lye nearest to the superficies of the earth, for it cannot sink above ten feet deep though the rain be never so much. Also this water is in Summer-time stronger in the morning than at noon, because the coldness of the night doth somewhat bind the earth, and the heat of the Sun openeth the same, thereby making it the more easie for the Mineral spirits to evaporat out thereby.

To prevent the inconveniencies of rain, it were to be wished that there were a very deep trench (yet not so deep as to cut a funder any of the veins through which the water passeth, if any should lye within six, eight, or ten feet of the superficies of the earth, as it is possible some may) made round the well, and bridges, made over some places of the same; for as by this means the rain would be carried away, so also the water in the boggie ground adjoyning to it, which may perhaps sink into the veins of the spring, and corrupt the same, would be dreyned away, and the well by this means much improved, for the ground about it is spongius, and drinks in water apace, the uppermost part thereof to to the depth of a foot, consisting of that hollow earth of which is made peat and turfe, and that beneath it being sandy, and also hollow.

CHAP. VIII.

Of the vertues of the Spaw-well, to whom, and in what cases profitable, or hurtfull.

I Shall not stand here to reckon up all, and the several vertues of Vitrial, as not properly conducing to our present purpose, because the varieties of its operations depends upon the variety of the forms, in which it is administered, or used; for the Salt thereof hath one operation, the *Colcothar* another, the corrosive spirit another, and that subtile acide penetrating spirit, (which *Theophrastus* calls his great secret, or *Arcanum* against the Epilepsie, and other such symptomes, because of its wonderfull penetrativeness leaving no part or places of the body unsearched) another, and with this hath the spirit of the Spaw water great affinity, & is therefore so much the more excellent, as being so much the nearer to it, *Primum ens* as *Helmont* calls it. Now note by the way, that although this spirit cannot be by it self extracted out of this water; yet it may be extracted out of Vitrial, yet by a very expert artist.

This water according to its first qualities cooles and moistens actually, heats, and dries potentially. And by these four qualities, the di-

distempers of the body consisting in the excess either of heat, cold, driness, or moisture, are tempered, every quality altering its contrary, and reducing it into its natural temper. And indeed it is worth taking notice of, that in such cases a distemper will rather be altered by its contrary, than increased by its like. As for example, if the distemper consists in heat, the heat will be allayed by the coldness of the water, and not be made more intense by the heat thereof (although the heat continue longer than the coldness, for the water is quickly warmed in the stomach, and then the potential heat is reduced into act, and continues) and so on the contrary, I mean If the water be taken regularly, and cautiously, or otherwise such happy success may not be expected.

Now according to other qualities, viz. second, & third it cuts, dissolves, attenuates, abstergeth viscidus, tartarous humours in the stomach, messenteric, hypochondries, reins, bladder, &c: and evacuateth them by Urine, as being indeed very diuretical, and by consequence opens the obstructions of the said parts, which are the occasions of most distempers, and diseases. It penetrates also through every narrow, occult passages of the body, where other medicines cannot come. Moreover it corroborates, astringeth, and laxateth, and divers such as these, and the former contrary operations hath it upon the body of man.

Now

Now note that although its operations are thus contrary, and the cures effected thereby, of so contrary natures, yet this is no other than what consists with, and conduceth to the preservation of nature, for if by its astringent any retention is caused, yet nothing is retained, but what should not be evacuated, and if by its laxating, evacuation is promoted, yet nothing is evacuated that should be retained. It dries nothing but what it finds too moist, and flaccid, and so on the contrary, and it heats nothing, but what before was too cold, and so on the contrary also. I speak now as to the generality of its operating, and do not deny but there may accidentally something happen contrary to general observations. But as for most exceptions that are, or can be made, either they may easily be answered or any accidental or casual prejudice be easily prevented, and the credit of the Spaw maintained. If any shall object and say by its coldness and moisture it weakens the liver more than by its heat and driness it corroborates it, and thereby occasioneth a drop sic, where before was none, and where it finds it, increaseth it. To this I answer, viz. if the body be well prepared first, and the water pass freely, and other such directions and cautions observed as should be, and I have præscribed in the following chapter, it doth not onely prevent, but cure the drop sic by heating, drying, and corroborating the liver.

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And if any shall object that it astringeth and bindeth the bodies of some, so much that there is no ejection of their excrements by stool for two or three dayes together, I answer, that it is true, this may happen sometimes, and it may be oftentimes by reason that those humours which should irritate the bowels to expel and eject their excrements are diverted through the ureters, by which means also the bowels become more dry, and dull, but yet this inconveniency may easily be remedied, and prevented, by taking every night at bed-time a little Cassia, or some such lenient medicament, and sometimes a glister, or suppositorie.

Many such like observations, and exceptions may be made against mine aforesaid positions, but they may as easily be answered (*salvâ ad huc famâ aque Spadanæ*) as made.

Now the manifold vertues, and various operations of this Spaw (as effecting cures of a contrary nature) being premised, it will I hope, be easie to conclude, what distempers, symptoms and diseases it is effectual against.

It allayes all acid, gnawing, and hot humours, and cures all such symptomes as proceed from thence, as agues, consumptions, quincies, tumours, impostumes, ulcers, wounds; it stops bleeding, the over flowing of choller, the dysentery, and such like fluxes.

It corroborates the brain, nerves &c. and prevents or cures the Apoplexie, Epilepsie, Palsie, Vertigo, inveterate head-ach, and madness,

ness, and all such symptoms as proceed from the weakness, coldness, heat, dryness, or moisture of the same.

It corroborates the stomach, and causeth good digestion, consumes crudities which are the causes of obstructions, and breed ill blood and infirm flesh or an ill habit of body; it maketh the fat lean, and the lean fleshy, cureth, and preventeth the chollick, and worms.

It strengtheneth and openeth the Lungs, Liver, Spleen, messentery, and cureth difficulty of breathing, the Asthma, the dropsie, melancholly and fearful, passions Hypochondriacal wind, and vapours (offending the head and heart,) which most women and many men are afflicted withall. It doth also upon this account cheer the heart, cure and prevent the palpitations, and passions thereof, as also all faintings.

It purifieth the blood, cures the scurvy, even in those whose teeth are ready to drop out of their heads, by reason of the extreameity thereof, also the foul venereal disease, the leprosie, Jaundise, yellow, and black, and for the more perfect effecting of these cures, it doth in many open the hemorrhoides.

It provoketh Urine, and cureth the suppression and allayes the sharpnes thereof, it diminisheth the stone in the bladder, by dissolving the soft superficial part thereof, and evacuating that mucous slimy water in which it is involved, and by this means also it pre-

pare it for cutting, for sometimes this stone cannot be felt, by reason of that slimy mucus, which mucus it self doth also sometimes by its torments counterfeit the stone, where it is collected in a great quantity, being of an acid tartarous nature. It forceth out from the kidneys, and bladder abundance of sand, and small stones to a great number, and sometimes such as are as big and as long, as long pepper. And as it cures all ulcers, and wounds in the body, so especially and much sooner in the reins, and bladder, suppressing also the pissing of blood, and the gonorrhea.

It cures the Gout, Aches, Cramp, convulsion in what part of the body whatsoever, and giveth great ease therein suddenly.

It openeth all obstructions, and suppresseth all manner of over-flowings in Women, strengtheneth the womb, cureth the mother, maketh the barren fruitfull, and is a great preventative against miscarryings, and rectifies most infirmities of the womb.

Note that this water doth not help all parts, cure all these infirmities after one, and the same manner; for some part of the body, it helps *per se*, as we call it, and some *per accidens*: *per se*, it helps those, through which it passeth and toucheth, and that either by its crass substance, as the Mouth, Jaws, Stomack, Messentery, Liver, Reins, Bladder, &c. or by its Spiritual parts, which do penetrate the whole body. *Per accidens* it helps those which

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are distempered by consent, or by the obstructions of other parts, and this by removing the obstructions thereof.

It is also used by way of infession in griefs of the womb, and by way of injection, into that as also into the bowels & bladder, where all the qualities act immediately upon those parts, allay the sharp, and hot distempers, mitigate the pains thereof, healing and corroborating the same.

It may moreover be used by way of fomentation, and lotion in external wounds, Ulcers, Itch, or Scabs, and being dropt into soar eyes wonderfully cooleth, drieth, and cleareth the same.

In a word, if any intensions in a medicinal way, be to be performed by allaying distempers, opening, obstructions, evacuating superfluous morbid humours, and corroborating all the parts of the body, those are effected in a very good measure, if not fully and perfectly by this water. And I my self have seen many of the asorenamed diseases cured by the help thereof, and for other cures effected thereby, I have been assured by them themselves who received the benefit, or by others who have been eye witnesses of the same.

Some may demand whether this water may be administred to Children, Old, Men, and Women great with child.

Sol. I. As to the first, although the heat of children be soon destroyed by cold, yet

this water may safely be given to children of a year old , if the water which they drink exceed not the strength of their stomach, or if their stomach can bear it. And *H. ab Heers* saith , he saw a sucking child drink of the *German Spaw* with good success , and some children very young have taken of ours, not without benefit.

2. As to the second , It is true that their heat also is very little , and soon extinguished by cold, yet if the strength of their stomachs be able to carry it off, without a manifest dejection of the appetite, it may safely to them also, but not in so large a quantity as to others, be administered.

3. And as to third , It is true it is diuretical , and may seem dangerous for them to take it , yet it hath been observed, that many have taken it securely enough , some when they have been very young with child , and others , when near the time of their bringing forth. I shall not give too much liberty, neither shall I lay too great a restraint upon them, Onely I say, it is safest for them to take it in the fourth, fifth, and sixth moneth, and *Hippocrates* himself will admit of purgation , at that time. But if any be very desirous to take it before, or after by reason of some griefs urging them thereto , let them use it cautiously and in less quantity, and withall take something every night to prevent the inconveniencies thereof , as Pearl, Corall, powder of hartshorn, or the like.

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Q. It may be demanded, whence it is that the excrements upon the taking of this water become black.

Sol. This blackness is not from the mixture of black melancholy humours as many will have it, for if the soundest healthiest body in the world, who can in no wise be suspected to have any adust black choller in him his excrements will also be tinged black therewith. Besides, we do not find that one mans body in twenty, that are dissected, have any such black humours in it, nay, although he were the most melancholly man in the World, & therefore to impute it to a mixture of this, is a great error. Neither do I impute it to Iron onely, as *H. ab Heers*, who, because Iron did the like, would not ascribe it to any thing else. But it seems he had not, as it appears by his own words, observed that Vitriol would do the like, and that either of Iron, or Copper, and that although, Iron being taken inwardly, the excrements are tinged black, it was by the Vitriol which was made in the body by the acid spirits thereof, resolving the esurine Salt of the Iron, and corroding it into a Copperas, he, I do suppose, never considered, and the reason he gives to prove, that Vitriol doth not discolour the excrements, is, because oyl, or spirit of Vitriol will not. But herein he argues a *conjunctus ad disjuncta*, and therefore his argument is of no force. For here is but a part of the Vitriol, viz. one part abstracted from the other, and that not with-

without the destruction of the species. Now if the species could be conserved it might be done, although it were volatile and more spiritual as the Vitriol is in this Spaw; for the truth is the same species may be fixed, and yet become volatile, and more spiritual, and yet all this while the species be conserved.

Note here by the way, upon what account it is that Iron, or Steel opens obstructions; and it is this, *viz.* There being a great affinity betwixt the esurine Salt in Iron, and all acid unspecificated spirits, the acid spirits in the body which are the cause of fermentation and coagulation, and by consequence of obstructions, do presently forsake those parts, and humours where they are seated, and betake themselves to the Iron, which they endeavour to dissolve, and so be united to the aforesaid Salt that is in it, (to which union they have a natural propensity) and so being therewith united, are with the same ejected, together with the obstructive humours, which at the same time are ejected, *viz.* when nature is strongly irritated to expel the Iron, as being very offensive to her.

C H A P. IX.

Of some general directions to be observed before, in the time of, and after the taking of the Waters.

THERE are seldom any distempers, or diseases that occasion people to go to the Spaw, that are without peccant, excrementitious, obstructing humours, which must of necessity be removed before the drinking of the waters attempted: and that either because those crude, gross humours in the greater vessels will be by the force of the waters carried down into the narrower passages, and there cause greater obstructions, and by consequence Feavers, Dropsies, Gripings, &c. and also hinder the free passage of the waters, to the endangering of many unthought of inconveniences, and symptoms; as also because nature, being thereby disburdened of the load of grosser humours, will be the better able with the assistance of the waters to overcome, digest, and evacuate the thinner, and those that are left behind, and the sooner recover its natural vigour, and sanitude.

Now for the Medicines to be administred, they must be elected suitable to the humour offending, and proportioned to the strength

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and constitution of the patient. I do in most cases very much approve of vomits, because they do effectually cleanse the stomach, and the *primas vias*, and instead of them, where they cannot be safely, and conveniently used, *biera picra* comes next in place for absterging, and cleansing the stomach, bowels, mesentery, and making free passage for the water to pass to the Liver. And after either of these, some proper lenitive for the opening the passages through the Liver, Ureters, Kidnies and into the Bladder.

Phlebotomy also, or letting of blood is in many cases to be considered of, viz. if the veins and other adjacent vessels be oppressed with blood, or any peccant humours, for thereby they will be made more fit for the waters to pass through them, and the virtues thereof into them.

Also in case of very obstinate obstructions, I advise that a chalybate course of Physick be run through for a certain time, that thereby the waters may with the less resistance act their parts, and sooner, easier, and more perfectly effect the intended cures.

Now after such preparation is made, and the patient come to the Spaw, let him also then take some easie vomit, as of Oxymel, or wine of Squills, or the like, or some *biera picra*, the first day after he is come thither, and the next morning after that some Lenitive, as Lenitive Electuary, Cassia Manna, Tamarines, infusion of Sene, Rhabarb, syrop of
Roses,

Roses, or the like, according to the humour that is to be evacuated, and then let him cheerfully, and confidently begin to drink these waters with a resolvedness to observe all such rational directions, as he shall find in this, and the next ensuing Chapters prescribed. But for poor people, or they that loath all that bears the name of Physick, drink three or four mornings of the Sulphur-well, for that will in a good measure effect the same.

When any one is resolved for the Spaw, let him then first apply himself to some experienced Physitian, who shall be able to understand his constitution, distemper, and the nature, and use of the waters themselves, that accordingly, as cause shall require, the more succesfull preparatives may be administred, and the more effectual directions given. This I advise the rather, because there be divers Physitians in the Nation, who never saw, tasted, scarce read of the waters, or conversed with those that know them, yet send their patients, such as they account incurable, and desperate, thither, giving them such directions for the drinking the waters as the very Spaw-women themselves laugh at.

A due preparation being premised, let him that drinks the waters begin with four, or five, or six half pint glasses, more or less as his stomach can well bear, and so by degrees proceed to two or three glasses more every day until he come to the height, and his full dose, which will be when he

can take no more, without a manifest oppression and nauseousness. Some will drink twenty, some thirty of these glasses in a morning, and some can not take half so many.

In the morning before the water be drunk, let first all excrements be evacuated, either by nature, or art, as by glysters, suppositories, or some pills, or lenitive taken the night before at bed-time; for the retaining of the excrements hinders the concoction of the waters (if I may call it a concoction) and by consequence their passage through the body, whereby are caused pressures, fluctuations, tensions, gripings, and sometimes cold sweat.

Betwixt every two, or three, or four, or five glasses, let some exercise be used, of which more largely in the Chapter of exercise. And for the better passing of the waters, comforting the stomach, and preventing of nauseousness, let some good cordial, stomachical spices, seeds, and roots, be taken betwixt while, as Annisseed, Caryoway and Coriander confects, Citron, or Lymon pilled candied, or dried, Pepper lossenges, Cardamums, but above all I prefer Elecampany root candied, or for want thereof Angelica root, or seeds, for they, especially Elecampany, as the Lord *Viralam* saith, breed a robust heat, and I am sure promote the passage of the water most eminently, and comfort all the vessels through which the water passeth, and withall make the water more effectual for the opening

pening of obstructions, and corroborating infirm parts.

I approve not of taking the waters too fast, or allotting too short a time for the drinking of the full dose, or proportion. I conceive that for the generality it will be most convenient for to take at first a quarter of the proportion, and then exercise half an hour, and then another quarter, and exercise till the water begins to be evacuated, and then a third quarter, with exercise half an hour more, and then the last part with exercise, till it be all passed out of the body. But if any cannot bear the drinking of a fourth part at a time, then let them take the eighth part, with a quarter of an hours exercise betwixt every while. To drink the waters too fast causeth for the most part nauſeousnes, oppresseth the natural heat, and compresseth the passages and vessels, that the water cannot pass so freely through them as otherwise it would do, and also causeth divers symptoms, as tensions, gripings, cold sweats, dejection of appetite, and the like. If a great quantity of water be cast upon a fire at once it extinguisheth it, but if by degrees, it maketh it burn the more furiously, and intends the flame thereof. *Ryetius* is therefore in my judgement very erroneous, as to this point, who would have the whole proportion be taken in half an hours time.

The time for the continuing the taking of the waters must be proportioned according to the greatness of the disease, and profit

received by it. In case any one after a due preparation, and upon a carefull observation of such directions as are required, shall not be able to bear the waters, and drink them without a manifest and eminent oppression, and nauſeouſneſs after ſeveral aſſayes, let him ceaſe preſently from the taking of them: but if upon the taking of them, he can take them without any ſuch inconueniency as ſhould cauſe him to deſiſt & yet perceive no benefit thereby; let him not preſently give over the uſe of them, as deiſpairing of any further benefit, but continue the uſe of them a moneth, or two, or longer, if the diſeaſe require it. In *Germany* they drink of the Spaw, not onely a quarter of a year together, but ſometimes half a year, and ſometimes a whole year if it be requiſite, and at laſt they receive the benefit thereof, by being cured of moſt deſperate diſeaſes, which otherwiſe were in the vulgar account incurable. It is a great errour amongſt us *Engliſh*, to allot but two or three weeks time, or a moneth at the moſt, for the taking of the Spaw, let the diſeaſe be what it will, and hence it is, that many miſs of thoſe happy cures, which by a longer continuance might have been effected, and this to the prolonging of their own miſery, and defamation of the Spaw it ſelf.

I do admit of the uſe of purging Phyſick, to be taken every eight, or tenth day, for the evacuating of crudities, which for the moſt
part

part are bred in that time, & also some groffer humour loosened by the water, or those which become crass, or thick by the waters themselves, carrying away the thinner part first; for these remaining in the body, would else be carried down into the smaller vessels, and cause obstructions, and thereby many other great inconveniences and symptomes, retarding also, if not utterly preventing the intended cure. Now the Medicaments I approve of most in these cases, are *Hiera picra simpliciter Galeni*, Rhabarb with Crystal of Tartar, and such like, to be taken one, or two dayes together, as there shall be occasion, and some Lenitive, as Cassia, or Lenitive electuary, or the like to be taken the next day after that, for the moistning of the bowels, and the better preparing the passages betwixt the stomach, and bladder, against the next repeating the use of the waters, which I advise may begin the next morning after. And in some cases Physick may be taken every day, nay, mixt with the waters themselves, as in *Germany*.

Now I know it is a common, though absurd opinion, that Physick is very prejudicial to those that take it, whilst they are in a course of drinking the waters, and therefore is most irrationally decried. Now the chief ground of this error, as far as I ever could understand is this, viz. Some certain years since, some famous Doctors attending upon persons of great quality, their patients,

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to the Spaw, did prescribe them the use of some Physick, with the waters, and it succeeded ill. This might be true, but what then? Might not those Physitians, though otherwise knowing enough, be ignorant of the right use of the waters themselves, and of the preparations requisite for the taking of them with success? Or might not they be willing to bring the Spaw out of credit; because it might happily cure their patients too soon, and thereby be prejudicial to them? Or might not their patients be unwilling to drink the water regularly; or disorder themselves in respect of diet, exercise and the like? Now whether either of these, or all these might be the cause of the aforesaid unsuccessfulness, I cannot determine, onely this I know, that the use of Physick is not onely not unsafe, but very necessary in the use of the waters, nay, and in many cases to be mixed with the waters themselves, as in the next Chapter I shall more particularly give you to understand.

Three or four dayes before giving over the waters, they must be abated by degrees, as at the beginning increased by degrees.

After the ending of the waters, immediately, even before you return from thence, some such purging Physick will be necessary as may evacuate all the water that shall remain secretly in the body, as oftentimes it doth, and withall comfort and strengthen the stomach, and Liver, and moisten the bowels if there

there be any feaver, of too great astringion of body afterwards. Also a very spare diet will be very necessary for a moneth after, for by this means nature will become master of the bodily infirmities, all crudities being removed, and prevented.

CHAP. X.

Of particular directions, and cautions in particular cases, and of preventing and curing such accidents and symptomes, which sometimes happen in the taking of the waters.

THEY that have a very good digestion may in the afternoon about five, or six hours after dinner, take half the quantity which they did in the morning, but with this caution, that they eat a very light supper after it; and as for those that have a very bad concoction, let them altogether forbear it in the afternoon, or at most drink but a glass for the diluting, and better distributing of the chylus, if already perfected.

If any shall drink of the water for the curing of an ague, let them so observe the time for the taking of it, that it may be all passed through them before the coming of the fit, because otherwise nature will be di-

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tracted in her motions, viz. evacuating the water by Urine, and the morbidick humour by sweat. And as for those that have a continual feaver, let them forbear it altogether, unless the humours be concocted and fit for evacuation, either by sweat or Urine, as I have more at large declared in the fourth Chapter, concerning the taking of cold water inwardly, in case of a feaver.

My advice is that they that have very weak and cold stomachs, should take the water a little warm'd first (i.e.) the cold being just taken off. The truth is, the coldness of the waters doth very little good at all, unless it be to allay a very great heat, and drought. So great a quantity thereof as is usually taken cold, must of necessity diminish the natural heat in cold constitutions. A glass of cold water cast upon a fire, though but small, may make it burn the more strongly, but if ten, or twenty be cast upon it, they, if they do not quite extinguish it, yet will so far check it, that it will a long time labour under the destructive contrariety thereof. And actual heat is far more suitable to nature, & if so be the vertue of the water is not diminished thereby, (as it is not, as I have demonstrated by the second experiment in the foregoing Chapter) far more effectual, the potential heat thereof being sooner reduced into act without any checking, or oppressing the natural heat. The stomach being a nervous part, and of exquisite sense, must needs be of-

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fended with that, which is actually cold. This made the ancient *Grecians* and *Romans* drink most of their water, and wine hot, as we find in *Salmuths* collections. The *Lord Virulam* wonders that *calidum bibere* is so much grown out of use. If to drink an ordinary quantity of drink cold, were not approved of by the Ancients, with what face shall I commend the taking of gallons of cold water every morning for certain weeks together? I do therefore seriously advise those that have cold and effeminate stomachs to take off the cold from the water before they drink it.

If upon the taking of the water, it pass not through the body freely, but is retained, it is to be considered in what place of the body it is at a stand, that accordingly some appropriated means may be administered for the evacuation of it. For if it be retained in the belly, or hypochondries (which will appear by its rumbling, wind, tension, oppresure) a glyster will evacuate it; if in the stomach, which appears by a disposition to vomit, *biera picra*, or *Rhabarb* will be convenient for the opening, and cleansing thereof and making free passage for it from thence. If it be retained in the habit of the body and veins, which appears by oppresure, and a chilnel over the body, without the aforesaid rumbling, tension, wind, &c. I approve of *biera picra*, with *Jollap*, *Mechoacan*, or the like hydragogal medicaments.

They, that when they have taken the waters, cannot evacuate them for want of exercise, as being too feeble to stir much, or walk, and not having the conveniencies of horses, may either drink all their proportion of water in the bed, or take some part at the Well, and then go to bed, and there take the residue. I have oftentimes observed that the water would freely pass through many, when they were in bed, but would not otherwise, and the reason of it was as I conceived, because the passages of their body were contracted by going into the air, but more open by the warmth of the bed.

Now for the rendering the water more effectual, it will be necessary, as is the course in *Italy*, to make use of some specifics with the drinking of it. *H. ab Heers*, allowes of the decoction of Sanicle, Pimpernel, Scabions, &c. to be drunk in case of spitting of blood, inward Impostumes, Ulcers, Wounds, and Infirmities of the breast, and Lungs, the benefit whereof he experienced by many years practice. And why may not we do the like in several cases, as to allow of a spoonfull, or two, of the juyce of Saxifrage, or the like to be taken in the first glass, in case of the stone, or gravel, or to take Turpentine pills, or a bolus with Turpentine and Cassia the night before, and in case of very great obstructions, dropsie, and cold moist stomacks, or the like, to mix some Sugar of steel, or steel wine with the first glass? But note that in such cases, they

they are to be taken half an hour, or a whole hour, before the taking of any more of the water.

For the better passing of the waters, let the first glass be mixed with Sugar, Syrrup of Liquorish, or *de quinque Radicibus*, or Nitre, or Spirit of Salt, or Vitriol, Salt of Tartar, or a glass of white wine, in the midst of the water, or mixed with three, or four of the first glasses, or two or three glasses of the Sulphur Well in the midst of the Spaw-water, or a good draught of the decoction of Fennel, or Parsley-roots, be taken half an hour before the water. Note that some of the aforesaid things are penetrative and so force their way, and some are sweet, and therefore are sooner attracted to, and by the Liver, and so the more speedily evacuated.

In case of the necessity of any of the aforesaid mixtures, it will be convenient and necessary, that some experienced Physitian be first consulted withall. And if you meet with none at the Spaw, that you can confide in, York, and other places are not far, where you shall find such Gentlemen that are able to advise you, as concerning this, so also in any other case, and especially if any unexpected accident should fall out whilst you are drinking the waters.

In case in the taking of the waters, fumes, and vapours fly to the head as oftentimes they do, even to inebriation, let none be disheartened thereat, for either they are the spirits of

the water themselves alone , which will do the head much good , or else there is a mixture of wind from the stomach; for when that is filled with water, the wind that was in it must of necessitie be forced up to the head , but there it continues but a very short time.

And as there is no necessity of preventing it, so neither can it be well prevented : but yet for some satisfaction , let Nutmeg , and Coriander seed , being beaten together into a gross powder, be taken after every fourth part of the water ; for the gratefull vapour thereof will also be carried up to the head , with the force of the other vapours from the stomach , and withall somewhat corroborat, and close the mouth of the stomach.

Q. It may be demanded whether or no the rednes , and hot pimples of the face may be cured by the inward use of this water, and it is the more questioned, because it dries, and heats the Liver.

Sol. It is true, that for the most part the rednes of the face is increased by the use of this water , but yet notwithstanding, it may in a great measure be cured with the help thereof , with the observing of certain rules, and cautious which do much conduce thereunto. The patient that is thus affected (his body being well prepared by medicaments, & phlebotomie,) must in the first place drink of this water, ten or twelve mornings together , for by this time it will in some considerable

derable measure remove those obstructions of the messentery & Liver which are the chiefest cause of the aforesaid distemper, then let him be purged with some cooling lenitive, and then because the continual use of the water should not, as doth steel, heat the blood too much, or rather by its strengthening the inward parts, drive outwardly the heated corrupt humours of the body too fast, I advise that he do for seven, or eight dayes together drink clarified whey, made with cooling, moist, and diuretical herbs and medicaments, as Borage, Lettuce, Seagreen, Endive, Grass-roots, Parsly, and Fennel-roots, Nitre, Tamarines, Liquorish, and such like, and withall have a vein breathed, if nothing contradict it, and then return again to the use of the water for another fortnight, and after that again to cooling purges and the cooling, and clarified whey, as before, for a moneths time. Note that withall, that some topical Medicines are to be applied to the place affected, as oyl of the yolks of Eggs, oyl of Tartar, juice of Lemmon and Salt, *unguentum album*, but above all *flores sulphuris* dissolved in oyl, or the like. By such kind of means with the use of the Spaw-water, I would undertake to cure almost any red pimpled face whatsoever.

C H A P. XI.

Of the necessity, and manner of exercise, in the use of the waters.

EXercise is, whilst the water is in the body, very necessary, as being good to laxate the passages of the body, to excite the natural heat, for the better digestion of the waters (if as I said before, we may properly call it a digestion) for by this means, saith *Archigenes*, as also *Aetius*, the internal vessels being heated will more strongly attract, and expell. Some kind of exercise is, if strength permit, to be continued from the first glass to the evacuation of the whole proportion taken.

Now for exercise in particular, riding on a trotting horse, or in a Coach are the best, because thereby the muscles of the *abdomen* being pressed, do intend the expulsive faculty of the Ureters and bladder. And where those cannot conveniently be had, and used, I commend walking, bowling, pitching of the bar, and leaping, and the like, all which must be used so moderatly, as not to provoke sweat, for by sweat the water will be drawn into the habit of the body, to the endangering of a dropsy and such like symptomes. They that are not able to walk, nor have the accommodation for riding, must take the
waters

waters in their bed, for the warmeth of the bed doth as I said before, serve very well instead of exercise, and answers to the intentions thereof.

Sleep is very hurtfull, because in sleep all excretions, or evacuations of excrementally except sweat, which is thereby promoted, and for the aforesaid reasons to be prevented, are suppressed.

Sitting on the ground is hurtfull, and also standing in the Sun, and walking late in the evening.

CHAP. XII.

Of the time of the year, and day when the Spaw is chiefly to be taken.

IN frosty weather the water is strongest, because the mineral spirits thereof are by the binding of the earth suppressed and prevented from evaporating through the superficies thereof (as they do at other times) by which means the water becomes the more strongly impregnated therewith. But by reason of the inconveniency of journeying, and of the uncertainty of the frost, I prefer the Summer, viz. from the beginning of May to the end of September, and before and after, if the season be dry.

Ob. Some may object against the use of the Spaw in the Canicular, or Dog dayes, because, say they, *Hippocrates* in the fifth of his

fourth book of *Aphorismes*, saith, Ἐπὶ κνύα, καὶ πρὸ κνύος, ἐργάσθαι αὐτὰ φαρμακείαι forbidding thereby purgations, and evacuations, and these being forbidden, say they, how shall we prepare our bodies for the taking of the waters?

Sol. This aphorisme having been these many years grossly mistaken, hath been the occasion of the deaths of thousands, I say mistaken, because purgations are not here at all forbidden, but onely intimation given, that in that season, by reason of that usual extremity of heat, the humours being drawn outwardly towards the habit of the body are not so easily retracted, and evacuated by way of purgation, as being more remote from the medicament, and also in a contrary motion. Besides, who is ignorant of the great difference betwixt the climate *Hippocrates* lived in, and ours, as also betwixt his medicine and ours, which are both far milder and temperate than his? And who doth not know (being the same also which, *Heurnius* saith of the seasons of his Countrey) that *May* & *June* prove oftentimes far hotter moneths then *July* and *August*? It is needles to enter upon any long consultation of the *Vulgar* opinion, which is weakly grounded upon the said aphorism, and hath a long time been absurdly maintained, and the rather, because it begins to be generally exploded: And indeed, it is good for men to grow wise by others harms.

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In extream wet weather the water becomes far weaker than before, and the reason is, because the rain, although it doth not usually sink above ten feet deep yet may into some of the veins of the said spring, which lye towards the superficies of the earth. In such a season the water may best be omitted, (as having but little, or no strength in, at most, not enough to qualify the coldnes, and moisture thereof) unless it be corrected and amended with Sugar of Iron, made out of the very Mine of Iron, or with spirit of Vitriol, for want of the other.

The fittest time in the morning, is betwixt six and seven of the clock, for those that be of a strong digestion. But as for those that are very sick with a nauseousness in their stomachs, in case they rise early, I advise that they lye longer in their bed, and sleep for the better digestion of those crudities, for otherwise they will be carried down with the water into the narrower passages, and cause great obstructions, and the water thereby become more impassible.

As for the taking of the waters in the afternoon, I have occasionally declared my judgement with the reasons thereof, in the tenth Chapter, page 89.

C H A P. XIII.

Of the Dyet to be observed by Spaw-drinkers.

THe greatest reason why many receive but little benefit, and some none by the Spaw, is, because of their intemperancy in respect of dyet. This water for the most part begetteth a very great appetite, by reason whereof many forget themselves at Table, putting in more than nature can dispose of, and hence are crudities, the nursery of all diseases; And it is true what *Galen* saith, affirming, that no man shall be vexed with sicknes that is not oppressed with crudities. And whence crudities, saith *Hippocrates*, but from fulnes, affirming also, that to eat without fulnes is the rule of health? He also saith, that what diseases so ever are cured by evacuation, are caused by repletion: and do not we see that all diseases are cured by evacuation, viz. vomiting, purging, bleeding, sweat, and urine? When the Chylus is ill concocted, or rather corrupted (for *Aristotle* calls it *μέλαισις*, not *σπίσις*, corruption, not concoction) it passeth crude through the whole body, for the second concoction doth not amend the first, nor the third the second, so that hence of necessity great obstructions, the occasion of tensions, gripings, all manner of hypochondriacal

driacal distempers, stone, gravel, distemper of the head, heart, liver, stomach, bowels, limbs, and indeed of all parts. There is an *Italian Proverb*, that he that will eat much, must eat little, that is, by eating little he shall live long and so eat much. A sober dyet, as it prevents, so also cures many infirmities, and distempers by diminishing crudities already bred, and reducing all the humours of the body to the government of nature.

Let such dyet be used, as may not hinder the effects of the Spaw, being of a good laudable nourishment, of easie digestion, and may freely pass through the vessels, serving for the distribution thereof. Let not the meat be dressed, or sauced deliciously, so as to prolong appetite, beyond the satisfaction of natural hunger, and thirst, thereby causing a greater quantity to be taken in, than otherwise would, or nature requires, or can digest. For the most part meat offends more by its quantity than quality.

In more particular manner I forbid all flesh that is very salt, and fat, Bacon, Pork, Neats-foot, Tripes, tame Ducks, Geese, gizzards of Poultry, all salt Fish, Eels, and all things that come from milk (except Butter, Whey, Milk, Porrage, Cheef-curds) also Leeks, Onions, Parsnips, Cabbage, Muskmillions, Cucumbers.

Helmont forbids nothing, onely excess, saying, that Nature hates curiosities.

I could reckon up divers other things that I should forbid, but because they are never

used at the Spaw, it will be needles to mention them.

I disapprove not of Beef, if it hath been salted but a week, especially for those that love it.

I allow for those whose bloud, and Livers are hot, Pears, Apples, Plums, Cherries, Rasp-berries, ripe Goose-berries and raw Sallets, but with this caution, that they be eaten a little before supper, and also sparingly, and one glass of white wine drank after them, for they do temper the bloud, and promote the curing of the distemper thereof.

I forbid much variety of meats, because of the unequalness of their concoction, and because nature is (although the pallate be not) best satisfied with simplicity of dyet. And excellently doth *Macrobius* discuss this point.

As for drinks, I commend beer, or ale, that is neither too small, or too new. They, whose stomacks are very cold, may drink Beer, or Ale as strong as can be made, and also a glass, or two of Sack with a tost put into it, which they may eat; and these do much further, and help concoction.

I approve of the drinking of pure, thin, well refined white and Rhenish wine, but not at meals, unless in a very little quantity, because they are very diuretical, and penetrative, carrying down with them to the Liver, and through the narrow vessels, the crude juyce of the meat, before it be concocted, thereby

thereby endangering obstructions; but let them be drunk a little before supper.

The time of eating must be considered according to the passing of the water through the body, for when the Urine begins to change its colour, passing from white to a higher colour, then is it a sign that the water is passed through, and then something may be eaten and not before, unless when good part of the water, although not all, hath passed through freely, and then ceased for an hour, or two, and then also it is time to eat something, for it may be that nature hath disposed of the residue that is left behind, & retained, for some other uses, as to moisten some dry parts of the body, or the like.

They that are first ready to eat, may stay their stomachs as we call it, with a mess of broth, which commonly is there made very good, and then have so much good fellowship and civility to wait for their dinners till all the good company of the house be ready for the same.

Let the supper be larger, than the dinner, because in the evening the stomach is less laxated, and languid, than at noon, and can therefore concoct a greater quantity of meat. Yet the supper must not be very large, neither greater than what the stomach can be well able perfectly to concoct before the next morning. Let it be ready at six at least, if not seven hours after dinner.

I advise that all, whether it be at dinner, or
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supper, that they leave with an appetite, & eat not half so much as the Spaw drinkers usually do, indulging their pallsates, and gratifying their stomacks according to the measure of their appetites, which many times is rather adventitious, or preternatural, then natural.

I utterly disapprove of mixing of the Spaw water, with either Wine, or Beer, but yet I allow, of the drinking of a glass of it self at bed time, for the corroborating and closing of the mouth of the stomach, and suppressing of vapours, which would otherwise disturb the brain from quiet sleep.

CHAP. XIV.

Of the Sulphur-well.

THis is called the Sulphur-well, by reason of its Sulphurious odour, although besides this, it hath two other qualities, viz. saltness, and bitterness. I shall in the first place endeavour to prove, whence it contract its saltness, and thereby I shall the better make to appear the cause of it stanch and bitterness. Now, because the Salt, which this water yields upon evaporation, is of the same nature with, & cannot be distinguished either in odour, or taste (the stanch being lost in the evaporation) from common black Sea-salt, I shall first declare what is the cause of the saltness of the Sea, which is no other than
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that of this water. And first I shall shew what is not the cause of it, thereby confuting the opinion of many ancient Philosphers, and their followers.

1. The saltness of the Sea, is not caused by the Suns exhaling the sweeter parts out of it, as was the opinion of *Aristotle*; for this suppoeth that there was the same saltness in the Sea before, but was not, but upon this account manifested, but this can not be, for then, why are not other waters, as Rivers, Ponds, Lakes, &c. made saltish also by the Suns exhaling their sweeter vapours.

2. The Sun doth not boil into the Sea, by the vehemency of its heat, that saline tast, according to *Pliny* being almost of the aforesaid opinion. for then, why doth not the Sun work the same effect, upon a Pond, or Vessel of water, on which it may work more vigorously, by heating more vehemently, viz. (because it is less resisted, by reason of the small quantity of water in them) than on the Ocean?

3. This saltness is not caused (as *Scaliger* would have it,) by rain, mixt with hot, dry, and terrene exhalations; for the rain it self would also then be saltish, which indeed is most sweet, and if it were saltish, then why are not Pits, Rivers, &c. which are many times filled with Rain-water, saltish also?

Now the weakness of these opinions, viz. (the chiefest that have usually been embraced) being detected, I shall shew from whence

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very probably this saltneſs of the Sea may proceed. We muſt therefore in the firſt place conſider that the Sea is not ſimply ſaltiſh, but ſaltiſh and bitter together, that is, it hath a taſt made up of bitterneſs, and ſaltneſs: for which cauſe, as ſaith, our learned Countrey-man, M^r. Lydyat, in his *diſquiſitio Phyſiologica de origine fontium*, Chap. 9. *de ſalfedine maris*, the Latines gave theſe two names to it, *viz.* *Mare, quaſi amarum, & Salum, quaſi ſalſum*. And this *Ariſtotle* himſelf conſents to, giving the reaſon of thoſe two taſts in general, and of them in the Sea in particular, where he ſaith, that all kinds of taſts ariſe from a kind of terreneſs more, or leſs aduſt; but bitterneſs from a terreneſs, very much elaborated by a fiery heat in the burning bowels of the earth; and ſaltneſs, where that heat is ſomewhat remitted. If ſo, then let us conſider whether there be not abundance of terrene aduſtneſs in the bowels of the earth, and gulfs of the Sea where a bituminous fire is alwayes burning, being fed by water (as I declared more at large in the 2. Chap. *viz.* *Of the original of Springs in general*) and that whether we may not probably conclude, and eſpecially becauſe bitumen is bitter, and very full of Salt, that the burning of the bitumen together with the terreneſs therewith mixed in the gulfs of the Sea be not the cauſe of the ſaltneſs thereof. Moreover, that bitumen hath a great power to communicate to, and beget a bitter, and ſaltiſh taſt in water, is confirmed, by that
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which Geographers write concerning the Lake of *Palestina*, which is called in Greek *Ασφαλτης*, i. e. bituminous. For say they, the Lake is so bitter, and saltish, that no fishes can live therein, and it is called in sacred writ the salt sea κατ' ἑξοχὴν. And Historians say of it, that if a man be cast into it bound hand and foot, he cannot be drown'd; and the reason of this is the saltness thereof, for we see that waters bear the greater burdens, by how much the saltier they are, witness the difference betwixt the Sea, and fresh Rivers, and our boiling of brine till an Egg swim thereon, and will not sink.

This being premised, it will be easie to conclude from whence the saltness, and bitterness of the Sulphur-well proceeds. And as for the stinking odour thereof, that I suppose is caused from the vapours of the burning bitumen, and adust terreness mixt therewith, which lye not far from the very head of the Well.

Ob. If there be the same reason for the saltness of this Spring as there is of the Sea, then why is there not the same reason for the Sulphurous odour of the Sea as of this, and why doth not the Sea receive, and retain the same odour as this doth?

Sol. I do not deny, but the same odour may be communicated to the Sea, as to this water, together with the saltness thereof; but because the saltness thereof was communicated to it by degrees, viz. from some certain

gulls of the Sea, so also this odour; for it cannot be rationally conceived, that the whole Sea received all its Salt into it self at one time after a natural way, and therefore being such a great body must become saltish by little and little even insensibly. And accordingly the Sulphurous odour also is imparted to it insensibly, and although the saltness may continue by reason that the Salt it self is of a fixed substance, yet the odour being of a subtile volatile nature, is exhaled by the Sun, and so lost. But now the case is far otherwise in the water of this Sulphur-well, for this is at once fully impregnated with the said saltness and Sulphurous odour, and immediately passeth away through narrow channels, and veins of the earth, without any vanishing of the odour (by means of the Sun, or otherwise) which it contracted from the bituminous vapours.

Ob. What is the reason that seeing this water hath passed lately through the bituminous burnings, as it appears by its fresh odour of the same, should be cold, and not hot, as hot Baths are?

Sol. 1. It was the opinion of *Fallopins*, that such kind of waters proceed from a remote fire, but passing through narrow passages retain their full odour, and taste, (which cannot be vanished by the way any otherwise, than smoak through a Chimney, or pipe) although by the length of its passage, it may loose its heat.

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2. Though the fire be near to the superficies of the earth, where this water breaketh forth, yet it is very probable that the coldnels thereof may proceed from a mixture of a cold spring before the breaking forth thereof. Neither let it seem strange to any, that cold springs and hot may be so near together in the bowels of the earth: for just above the head of this Sulphur-well there arise two cold Springs, which meet and run down within a few feet of the head of the same. And Mr. Jones in his treatise of Buck-stones Bath in *Derbshire* saith, that the cold Springs and hot Springs are so near, that a man may put one finger in the cold, and another in the hot.

Having in some measure declared unto you the cause of this Sulphur-well viz. of its salt-nels, bitter-nels, and sulphurous odour, I shall in the next place give an account of some experiments, and observations which I made, and they are these. viz.

1. If Silver be put into this water it is thereby tinged first yellow, and then black, but Gold is not all discoloured thereby.

2. If this water be a little boiled, it looseth its tinging property, and also stinking odour.

3. It coagulates milk, if it be boiled therewith.

4. The distilled water thereof looseth its odour, and doth not coagulate milk.

5. If the water be boiled, it will still coagulate milk, though it looseth its odour.

6. Seven gallons yield by evaporation a pound of Salt, which though at first black, I have made as white as snow.

7. This Salt coagulates milk also.

8. This water kills worms, and such kind of creatures presently, if they be put therein.

9. I filled two Vial glasses with this water in wet weather, and stoppt the one, but the other I left open. The water in that which was stoppt, within an hour, or two, became white, and thick, and within two, or three dayes deposited a white sediment, and the sides of that glass were furred, the water in the other glass altered not.

10. I filled two Vial glasses in fair weather, whereof the one I stoppt, but the other left open, the water in neither of them turned colour any whit considerably, onely a kind of a thin whitish matter, after two, or three dayes fell to the bottom, the water continuing very clear. The water of that glass which was stoppt, retained its odour most.

11. A pint of this water weighs two scruples, i.e. fourty grains more than a pint of common Spring-water.

Note that the reason of its tinging white metals is not from any bodily Sulphur, or bitumen mixt with it, (for the substance of them will not mix with water, but swim on it, as in the Spring at *Pitchford* in *Shropshire*, and in *Avernia*, in *France*, and in divers other places)

places) but from the vapours, or the subtile atomes & *efluvia's* thereof, which are mixed with the water, and in boiling are evaporated.

The reason of its coagulating property is from some occult acidity in the Salt thereof, which to sense is not perceptible, onely by effect.

Out of the Salt is drawn a very good spirit of excellent vertue, as I shall declare in the next Chapter.

Before I conclude this Chapter, it will be worth taking notice, that about 240 yards above the head of this Sulphur-well is a bog, of about twenty yards diameter, in which I digged a mineral kind of substance, like the finders of Iron, but almost rotten, being corroded with some acid spirits, of which that bog is full, as also other places. This mineral substance being cast into the fire burns blew, and smells like Sulphur; It is in tast like Vitriol, and out of it Vitriol may be drawn. nay, in time it will be almost all resolved into Vitriol. For I washed it, and set it in a Cellar for two, or three dayes, and it was covered over with a white sweetish Vitriol; which I dissolved in water, and set the said substance in a Cellar again, and it contracted the like, & I did as before. still reiterating this work till it was almost all turned to Vitriol. In the said bog I found three or four sorts of waters, *viz*, a Sulphur, and Vitrioline, and of each two sorts. This was
done

done the last day of my abode there, and therefore I had not time to make any further search, onely some of that mineral substance I took with me, with which I tried the aforelaid experiments. If any Gentleman would bepleated to expend some costs in digging up this bog, and erecting some new Wells there, he would prove an acceptable benefactor to his Countrey, and it may be some new kind of water might be discovered hereby having yet more vertues than any of the former.

Note that the stink of this Sulphur-well is perceived afar off, especially in moist and cold weather.

C H A P. XV.

Of the vertues, and uses of the Sulphur-well together with directions and cautions for the taking of it.

THe use of this water is either inward, or outward.

It being taken inwardly incideth, abstergeth, attenuates, and resolves viscous thick humours, and irritates every vessel of the body to expel whatsoever humours are offensive in them. It openeth, and removes those strong and obstinate obstructions, whether in men, or women, that would not yield to any other

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Medicine whatsoever. It doth oftentimes evacuate by stool great lumps of viscid slimy matter, which was certainly, whilest it was in the body, the cause of some great distemper, oppreasure, gripings, tensions, &c. and which could hardly any other way be removed.

It heateth, and quickneth the stomach, bowels, liver, spleen, blood, veins, nerves, and indeed the whole body, in so much that it consumes crudities, rectifieth all cold distempers in all parts of the body; causeth a good digestion, cures the Dropsie, Spleen, Scurvy, Green sickness, Gout, Cramp, Epilepsie, headache, Vertigo, Kings-evil, and all such Symptoms as proceed either from crudities, cold, viscid, slimy, or corrupt humours, which obstruct & distemper the stomach, Bowels, Mesentery, Liver, Veins, Brain, and Nerves. and these though of long continuance. It killeth worms infallibly.

Note that this water must be begun by degrees, and the full proportion be taken not at once, but at several times, exercise intermeduating, as in the taking of the Spaw.

The full dose, or quantity to be taken must be proportioned according to the constitution & strength of the party & his bearing of it, as also the humour offending, the predominancy of the distemper, and the aptness of the body to be wrought upon. In cold, dull bodies more may be taken than otherwise may. In general, let the proportion to be taken, be

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such, as may cause four, six, or seven stools, without any manifest inconveniency of the fewness, or multiplicity thereof.

Note that in many bodies this water works very quickly, and indeed too soon, and in such a case my advise is, that two, or three glasses of the Spaw-water be first drunk, for that will somewhat impede the sudden operations thereof, & cause it to continue longer in the body, for the better performing of its operation therein before it pass through it.

Note also that after the full proportion is taken, and in a good measure passed through the body, four, or six glasses of the Spaw-water may be drunk for the prevention of the excoriation of the bowels and fundament, especially in hot cholerick bodies.

They that cannot drink this water by reason of its stinking odour, and yet stand in great need of the effects thereof, may boil it a little while, till it hath lost its odour, and then drink of it; for although some vertue vanisheth with the odour thereof, yet the greatest and most effectual vertues which are in the Salt, and aforesaid subtile acidity thereof do yet continue as I have often tried, or if they please, put some Salt thereof into the Spaw-water, and so drink it, for indeed as I said before, the chiefest vertue lies in the Salt.

The Salt also thereof being rightly made, & put into any common Spring-water, doth in good measure perform the same effects.

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The spirit of this salt is of excellent vertue, if a drop, or two thereof be put into every glass of the Spaw-water, for it makes it far more penetrative, and indeed far more effectual against all distempers, and diseases, as the Dropsie, Gravel, Stone, and suppression of Urine, &c.

I advise, that they that have any inflammation, or excoriation in their bowels, abstain altogether from the taking of this water, because it will inflame them more; also they that have Ulcers, and inflammations in their kidneys, and bladder, and are troubled with a sharpness of Urine.

Such directions for exercise, and diet, as I have prescribed for the Spaw drinkers, I prescribe also to Sulphur-water-drinkers for the general; onely this liberty I grant them, viz. that these may exercise less, and feed a little more liberally than Spaw-drinkers.

This water used outwardly dissolves hard tumours, cures old Ulcers, the Scab, the Itch, the Scurff, Leprosie, and all such breakings out whatsoever, if the parts ill affected be washed, and bathed therewith, for it dries, consumes all corrupt humours in the habit of the body, and prevents all putrefaction of humours in the same.

It being used by way of a warm Bath for the whole body, is of the same efficacy, as Paracelsus saith, that his *liquamen salis*, i. e. brine is of, and that is to consume all humid distempers, whether hot, or cold, as the Dropsy,

fy, Gout, hard tumours, swellings of the legs, Leprosy, and the like, also it makes the flesh lean, and reduceth them into a natural dry, firm, healthy habit of body. but it must cautiously be done with the observing of such rules and directions, as I prescribed for bathing in warm water, as in Chapter the 4.

I wish there were more conveniencies, as fit vessels for bathing, at this Well, than are, for I believe that after a time, Baths with this water would grow more in use, and become as famous as those hot Baths in *Sommersetshire* for many uses.

The spirit of the Salt rubbed into any parts swelled, or pained onely, cures them presently.

And as the waters themselves are outwardly used for cleansing, and healing, so also there is a kind of slimy bituminous mud below the Sulphur-well, which will burn like Sulphur, and is of great efficacy for mollifying, digesting, and resolving hard tumours, and for corroborating weak infirm parts, and allaying of pains, and aches in the limbs, of what nature so ever, being outwardly applied.

As I am silent in particularizing cures, yet one strange cure I cannot but mention, *viz.* A certain youth came the last year to these waters from the more remote Northern parts, having on each finger a horn, covering the top thereof; and also a horny substance on his wrists, and face, which with the inward, and outward use of this Sulphur-water did

in a little time, being loosed thereby all fall off. If such excrescences may be loosened and made to fall off thereby, then *Attendite Cornigeri ! En vobis medelam !*

CHAP. XVI.

Of the Dropping, or Petrifying-well,

OVER against the Castle of *Knaresborow*, the River *Nide* running betwixt, ariseth a certain Spring, in the manner of other Springs in a high ground, which running a little way in an entire stream, is at the brow of a descent by a dam of ragged stones, divided into several trickling branches, whereof some drop, and some stream down, partly over, and partly through a jetting Rock, and this Spring is of a petrifying nature, for of it was the Rock, from which it distils, wholly made, and is by it daily increased, notwithstanding the cutting off great pieces from it. This water also generates stones where it falls, and likewise where it runs, but not all the way it runs, but near the place onely where it fell, the reason of which I shall presently shew.

If any stick, or piece of wood lye in it some weeks, it will be candied over with a stony whitish crust, the inward part of the wood continuing of the same nature as before. But any soft spongie substance, as moss, leaves of trees, &c. into the which the water can enter,

will thereby in time become seemingly to be of a perfect stony nature, and hardness.

Now the cause of this petrifying property is, as Philosophers call it, *succus lapidescens*, i. e. a stony matter which is in its *principiis solutis*, for indeed the *principia soluta* of all things, whether animals, vegetables, metals, or minerals are in a liquid form, and are concreted by degrees by a natural heat separating from them all accidental humidities, and fixing them into their proper species.

When the water, with which this *succus lapidescens* is mixed, is in part wasted by the Sun and air, it doth then deposite it, as being too heavy for it any longer to bear it. And when that is deposited, or fallen down, it doth by a continued addition, and concretion in time amount to a considerable stony mass.

For the better understanding the true nature, and causes of this water, I made these three experiments.

1. I evaporated away the water, and in the bottom was left a stony powder, very like to the powder of the stones of the Rock.

2. A pint of it weighs ten grains heavier than a pint of common Spring water.

3. It coagulates milk if it be boiled therewith, and the reason of this is, because for the *principiis solutis* of all minerals, nature hath provided some Sulphurous acidity for the better fermentation, and digesting them into perfection. The chief vertues of this water are to allay acid, gnawing, and hot cholerick humours,

mours, and to stop all fluxes proceeding from thence; It is also good against burstness, pissing of blood, all overflowings in women, and strengthens the back.

They that take this water, except in case of looseness, must every other day take a glyster, or some lenitive as Cassia, Manna, &c. every other night, in case it binds too much.

This water in many cases is better than the syrup of Coral, and the powder of the Rock, or rather the powder that remains upon evaporation maybe used for Coral; for the truth is, (as is the opinion of many Philosophers) that Coral is a certain vegetable, fed and nourished with a *succus lapidescens*.

The proportion of the water to be taken is from half a pint to half a gallon, according to the age, constitution, distemper, and place of the distemper.

The quantity of the powder is from ten grains to a dram, according to the aforesaid considerations.

C H A P. XVII.

of S^r. Magnus Well.

WHether *Magnus*, or *Mugnus* be the true, and Original name of this Well I could never yet be ascertained; It is usually called by the latter. Now whether this Well was Sainted from its real vertues, or
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onely supposed vertues attributed to it , because first Sainted , I will not stand now to dispute , but I rather believe the former. Dr. Dean, will not have any greater vertues attributed to it, than to common Springs, allowing it onely a bare name , and title. It seems the Dr. was no Catholick, or if he were S^c. *Magnus*, must not be his Intercessour.

Now the reason why he will ascribe no other than common vertues to this water , is because , as he saith , it hath no mineral vertues , and faculties , I suppose he means perceptible. But to this, answer might easily be made, viz; that waters oftentimes are impregnated with mineral vertues , and spirits to , although insensibly. Who would have thought that the dropping-well would have yielded a stony powder upon evaporation, and coagulate milk ? Besides if upon experiment nothing could be found perceptible to sense in waters, must we alwayes judge of things by sense, and not sometimes by effects ?

In many mineral waters the substance of minérales, and metals is mixed, in other some the gross, perceptible vapours onely, and in other some, the subtile insensible spirits , or rather atomes, and effluvia's. In this well the last onely , and they are the effluvia's of either Lead, or Tin mines (as is the opinion of some Philosophers , concerning such kind of Springs) which being mixed with the water, do not onely give activity to its coldness (as do cold atomes of the Northen wind to rain

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congealing it into snow, which will with much handling, heat the hands, and make them even to burn) but also a kind of fermenting nature to it, so that when the water hath a little entered into the pores of the body, it causeth a kind of light fermentation amongst the humours, and by consequence stirs up a heat in the habit of the body, and withall draws out the natural heat into the same. And this is apparent, for if any one enter into this water to Bathe, or wash himself, and abide there but a quarter of an hour, or little more, he will as soon as he comes forth, presently become very hot (his body being all over red) and so continue a long time, although he walk in the cold air; nay, although he put not on his clothes.

Nay, many times tender women, who dare scarce wash their hands in cold water, will adventure to go into it, although it be colder than ordinary water, with their linnen about them, and when they be come forth, go to the next houses, and lye in their wet linnen all night, and towards morning begin to sweat, and by this means are cured of many old aches, in what part of the body soever they are, and of swellings, and hard tumours, and agues, and indeed many outward distempers and symptomes caused either by cold, or hot humours, the latter being cured by an actual coldness, viz. if it be a bare distemper of heat only, for which alteration only will be sufficient; the former by the heat of

the body, being drawn outward & increased, whereby humours offending are digested, attenuated, & discussed, or evaporated by sweat. Also such distempers as are caused by too much chilness, and tenderneſs, are hereby recovered. And, upon this account it is, that they that are very tender in their heads, and wear many caps, and subject to take cold upon every slight occasion, are cured of this tenderneſs by washing their heads, two or three times in a day in cold water: for hereby the open pores, which let in the cold, & through which the natural heat did too much transpire, are closed, and stop't.

Before any attempt the use of this cold Bath, let them first consult with some able Physitian; and if they please, observe such directions for the ordering of themselves, as I have given in the fourth Chapter, concerning bathing in cold water.

This Well is square, with a high wall about it, and a howse adjoyning to it, where people make themselves ready for bathing, going immediatly out of it into the Bath.

This Spring riseth high about *May*, and falls low about *September*.

Now if any shall not approve of my *hypothesis*, concerning the nature of this Well, let them tell me of one that is more rational, and I shall not be ashamed to learn that, which I am convinc'd I did not know, or else let them embrace mine. The reason inducing me to declare this of mine is, because

I know it is the unanimous consent of most sound Philosophers, that waters running through Tin, Lead, and Silver mines, or minerals of a cold nature, may contract some imperceptible medicinal vertues from them, (and therefore *H. ab Heers*, and *Helmont* say, that many Medicinal Springs are called *fontes acidi*, from their effects, not sensible acid mineral tast) and also because I know that this Countrey yields almost all manner of metals and minerals, which an expert Artist, assisted with a good purse, would easily discover. I believe that many other Springs, of this nature might in that Countrey, and other such mineral Countries be found out upon examination, and triall.

Now for the conclusion of all, let not any one judge me to be a Catholick by this my approbation of this Sainted Well, for I am none; and as none my self, so neither do I hate those that are, or those of any other heterodox judgement whatsoever. Their living according to their own light, and within the bounds of civility, is a sufficient ground, for me to exercise good will, and love to them.

And as I do not out of any superstitious account attribute any medicinal vertues to this Sainted Well, so neither do I do it out of any affectedness to contradict *D. Deane's* judgement.

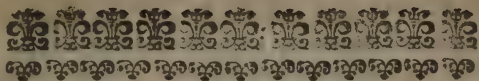
The reason of my vindication of it, is
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grounded upon some notable cures , which I have seen effected thereby. And the Doctor himself acknowledgeth, that it hath formerly been very much frequented by all sorts of infirm people : if so, then certainly not without some cause.

Now if it were but their faith in the water, and strong imagination, (as some may say) that cured them , yet let them use this water , or any lawfull means else that may exalt their imagination , if that may promote their cures.

FINIS.

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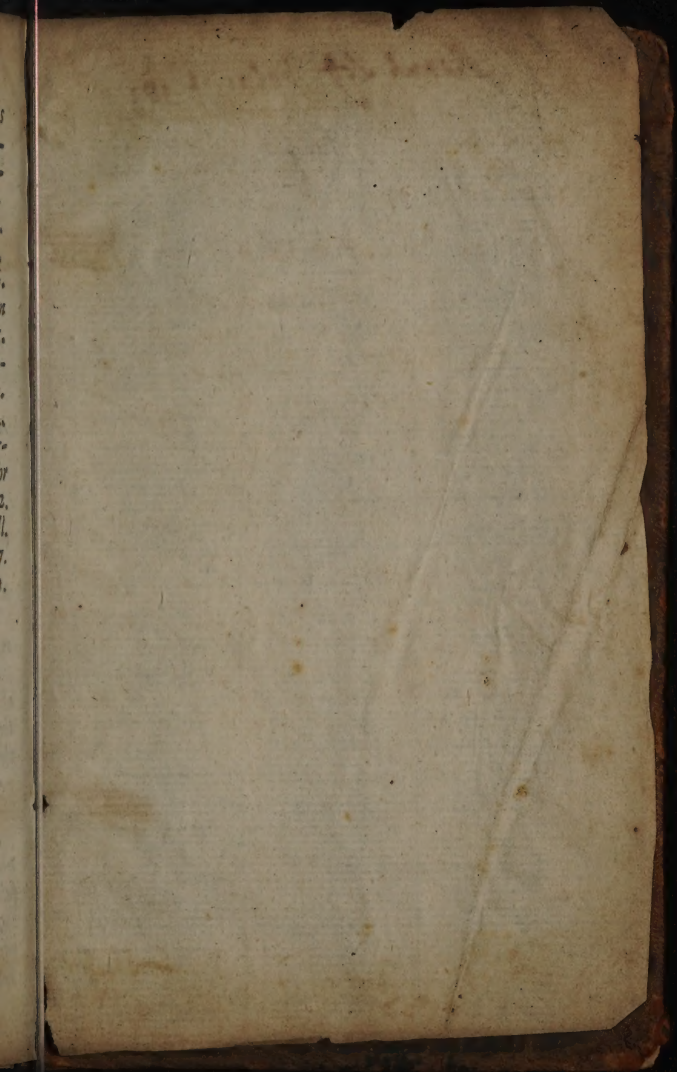
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